

PB-230 754

POLLUTION OF THE NAVIGABLE WATERS OF
EASTERN NEW JERSEY - SHARK RIVER TO
CAPE MAY. CONFERENCE HELD AT ATLANTIC
CITY, NEW JERSEY ON NOVEMBER 1, 1967

Federal Water Pollution Control
Administration
Washington, D. C.

1 November 1967

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PROCEEDINGS

NEW JERSEY

ATLANTIC OCEAN

CONFERENCE

**Pollution of the navigable waters
of Eastern New Jersey
-Shark River to Cape May**

**ATLANTIC CITY, NEW JERSEY
NOVEMBER 1, 1967**

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Conference in the Matter of Pollution of the
Navigable Waters of Eastern New Jersey, Shark River to Cape
May, at the Chalfonte Hotel, Atlantic City, New Jersey, on
Wednesday, November 1, 1967, at 9:45 a.m.

The Conference began

PRESIDING:

Mr. Murray Stein, Assistant Commissioner
for Enforcement, Federal Water Pollution
Control Administration, Department of the
Interior, Washington, D. C.

CONFEREES:

Lester M. Klashman, Regional Director,
Northeast Region, Federal Water Pollution
Control Administration, Department of the
Interior, Boston, Massachusetts

Dr. Roscoe P. Kandle, Commissioner, New Jersey
State Department of Health, Trenton, New
Jersey

PARTICIPANTS:

Hon. Clifford P. Case, United States Senator
from the State of New Jersey

Kenneth Walker, Deputy Director, Hudson-Champlain
Project, Federal Water Pollution Control Administration,
Department of the Interior, Metuchen, New Jersey

Lester A. Sutton, Facilities Program Director,
Northeast Region, Federal Water Pollution Control Administra-
tion, Department of the Interior

Mark Abelson, Regional Coordinator, United States
Department of the Interior

Arthur S. Merrill, Assistant Laboratory Director,
Bureau of Commercial Fisheries, Biological Laboratory, Oxford,
Maryland

Ralph J. Van Derwerker, Regional Representative,
National Center for Urban and Industrial Health, Public
Health Service, United States Department of Health, Education,
and Welfare, Region II, New York, New York

Lieutenant Colonel Edward T. Watling, Deputy
District Engineer, U. S. Corps of Engineers, Philadelphia
District, Philadelphia, Pennsylvania

Dr. Roscoe P. Kandle, Conferee and Commissioner,
New Jersey State Health Department, Trenton, New Jersey

PARTICIPANTS (Continued):

Mrs. Elizabeth M. Wallace, Oyster Institute of
North America, Sayville, Long Island

Richard Crema, Secretary-Treasurer, South Jersey
Shellfisherman's Association

Bruce M. Larrabee, Professional Engineer,
Chairman of the Barnegat Bay Waterways Improvement Association

Anthony N. D'Elia, President of the Council,
Township of Brick, Brick Town, New Jersey

Stanley Cottrell, Partner of William Cottrell &
Sons, Waretown, New Jersey

William Meyer, Representing the New Jersey State
Federation of Sportsmen's Clubs

John De Groot, Sanitary Engineer, Fort Monmouth,
New Jersey

THOSE IN ATTENDANCE:

Mark Abelson, Regional Coordinator, U. S. Depart-
ment of the Interior, John F. Kennedy Federal Building,
Boston, Massachusetts 02203

Peter W. Anderson, Chief, Water Quality Section,
U. S. Geological Survey, P. O. Box 1238, Federal Building,
Trenton, New Jersey 08607

THOSE IN ATTENDANCE (Continued):

Don Angell, CBS-TV, Philadelphia, Pa.

Len Antell, Reporter, Philadelphia Inquirer

William Augustine, Philadelphia Inquirer,
Philadelphia, Pennsylvania

Richard E. Bellis, Coordinator, Shellfish Control
Program. New Jersey State Department of Health, Health and
Agriculture Building, Trenton, New Jersey

Albert W. Bromberg, Superv. Sanitary Engineer,
Federal Water Pollution Control Administration, Hudson-
Champlain Project, Metuchen, New Jersey

Donald S. Carlson, Public Relations Director,
New Jersey Department of Health, Trenton, New Jersey

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Dale T. Coggeshall, Refuge Manager, USDI, BSWF.
Refuges, Bringantine N. W. Refuge, Oceanville, New Jersey

Stanley Cottrell, Partner, Wm. Cottrell & Sons,
N. Harbor Road, Waretown, New Jersey

Richard F. Crema, Secretary, So. Jersey Shell
Fisherman's Association, Box 345, Absecon, New Jersey 08201

John De Groot, Sanitation Engineer, U. S. Army,
Fort Monmouth, New Jersey

THOSE IN ATTENDANCE (Continued):

Anthony N. D'Elia, Council President, Brick Township, P. O. Box 27, Brick Town, New Jersey

T. R. Glenn, Jr., Director and Chemical Engineer, Interstate Sanitation Commission, 10 Columbia Circle, New York City

Harold H. Gray, Chairman Atlantic Pollution, Fed. Sportsman Clubs, Rd. 2, Box 213, Pleasantville, New Jersey

Paul E. Hamer, Principal Fisheries Biologist, New Jersey Division of Fish and Game, Nacote Creek Res. Sta. Star Rte., Absecon, New Jersey

Mrs. Herbert A. Howlett, League of Women Voters, 2305 Stockhouse Drive, Yardley, Pennsylvania

Herbert A. Howlett, Chief Engineer, Delaware River Basin Commission, P. O. Box 360, Trenton, New Jersey

Eugene Jensen, Federal Water Pollution Control Administration, Washington, D. C.

William J. Kleb, General Manager, Sea Clam Packers Association, Box 89, Wildwood, New Jersey

Ernest A. Kaeufer, P. E., Sanitary Engineer, Hydronics Corporation, P. O. Box 187, Metuchen, New Jersey
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Roscoe P. Kandle, M. D., Commissioner, New Jersey State Health Department, Box 1540, Trenton, New Jersey

R. I. Kellum, Division Engineer, Bureau of Public Roads, 25 Scotch Road, Trenton, New Jersey

THOSE IN ATTENDANCE (Continued):

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Bureau of Public Roads. 25 Scotch Road, Trenton, New Jersey

John A. Krohn, Work Unit Conservationist, U.S.D.A.,
Soil Conservation Service, 1112 W. Harding Highway, Mays
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K. L. Kollar, Director Water Industries & Engr.,
Department of Commerce, Washington, D C.

Bruce Larrabee, Chairman, Barnegat Bay Waterways
Improvement Association, 144 Adelaide Place, Lakewood, New
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Paul Learn, Reporter, UPI - New York Times, 1106
Atlantic Street, Atlantic City, New Jersey

William Librizzi, Sanitary Engineer, Federal
Water Pollution Control Administration, Hudson-Champlain
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Walter J McGee, Councilman, Brick Township, 303
Arrowhead Park Drive, Brick Town, New Jersey

Arthur S. Merrill, Assistant Laboratory Director,
Bureau of Commercial Fisheries, Biology Laboratory, Oxford,
Maryland

THOSE IN ATTENDANCE (Continued):

Joseph Monkoski, Civil Engineer, National Park Service, 143 S. Third Street, Philadelphia, Pennsylvania 19106

William Meyer, Chairman, Water Pollution Control Committee, New Jersey State Federation of Sportsman's Club, 26 Franklin Avenue, Beverly, New Jersey 08010

Donal Maxwell, President. So. Jersey Shellfishery, Leads Point, New Jersey

Patrick J McGann, Jr., 34 Broad Street. Red Bank, New Jersey

Alvin R. Morris, Technical Director. Delaware Estuary Study, 321 Chestnut Street, Philadelphia, Pennsylvania

Frank D. Neri, Councilman, Township of Brick, Laurelton, New Jersey

F. X. Popper, Captain, USESSA, Room 1407 90 Church Street, New York, New York 10007

Frank Randall, Shellfish Dealer, S. J. Shellfish, 223 S Lyons Ct., Pleasantville, New Jersey

Ellsworth J Sterner, Attorney, Brick Township, Waterways Improvement Association, Mantoloking, New Jersey

Morris B. Smith, Vice Chairman, Water Resources Committee, 94 Sun Valley Road, Toms River, New Jersey

Frank L. Sivard, Civil Engineer, North Atlantic Division, U. S. Army Engineers, 2nd and Chestnut Streets, Philadelphia, Pennsylvania

THOSE IN ATTENDANCE (Continued):

Ronald Sullivan, Feature Writer, New York Times

Lester A. Sutton, Facilities Program Director,
Federal Water Pollution Control Administration, Federal
Office Building, Boston, Massachusetts

Richard J. Sullivan, New Jersey Department of
Health, Trenton, New Jersey

Ralph J. Van Derwerker, Regional Representative,
NCUIH, U. S. Public Health Service, 42 Broadway, New York,
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Robert Vincent, Supv. Public Health Engr., New
Jersey Health Department, Trenton, New Jersey

Kenneth H. Walker, Deputy Director, Federal Water
Pollution Control Administration, Hudson-Champlain Project
Metuchen, New Jersey 08840

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Edward F. M. Wong, Shellfish Consultant, Federal
Water Pollution Control Administration, Needham Heights,
Massachusetts

Lt. Col. Edward T. Watling, Deputy District
Engineer, Philadelphia District, Corps of Engineers, 24th

THOSE IN ATTENDANCE (Continued):

and Chestnut Streets, Philadelphia, Pennsylvania

Raymond A. Webster, Supervising Engineer, New
Jersey Division of Water Policy and Supply, P. O. Box 1390,
Trenton, New Jersey 08625

Philip Wexler, Correspondent, A.P.

Opening Statement - Mr. Stein

P R O C E E D I N G S

OPENING STATEMENT

BY

MR. MURRAY STEIN

MR. STEIN: The conference is open.

This conference in the matter of pollution of the navigable waters of eastern New Jersey from Shark River to Cape May and their tributaries (New Jersey) involving the State of New Jersey and the U. S. Department of the Interior, is being held under the provisions of Section 10 of the Federal Water Pollution Control Act.

Under the provisions of the Act, the Secretary of the Interior is authorized to call a conference of this type when he finds that substantial economic injury results from the inability to market shellfish or shellfish products in interstate commerce because of pollution subject to abatement under the Federal Act, and action of Federal, State or local authorities.

The purpose of the conference is to bring together the State water pollution control agency, representatives of the U. S. Department of the Interior and other interested

Opening Statement - Mr. Stein

parties to review the existing situation, the progress which has been made, to lay a basis for future action by all parties concerned, and to give the State, localities, and industries an opportunity to take any indicated remedial action under State and local law.

The conference technique is rather an old one. It is used informally by many State agencies in the normal conduct of their business in the field of water pollution control. The conference system was proposed by the United States Supreme Court as long ago as 1921 in the famous case of New York versus New Jersey, involving interstate pollution. I would like to quote from this decision:

"We cannot withhold the suggestion, inspired by the consideration of this case, that the grave problem of sewage disposal by the large and growing population living on the shores of New York Bay is one more readily to be most wisely solved by cooperative study and by conference and mutual concession on the part of representatives of the States so vitally interested in it than by proceedings in any court, however constituted."

We strongly support the conference technique and we measure our success by the problems which are solved at the conference table, rather than in court.

Opening Statement - Mr. Stein

In light of these very sage remarks by the Supreme Court more than forty-five years ago, a cooperative study has been undertaken by the State of New Jersey and the Federal Government. The problem has been studied.

We do have in this room some very experienced people in the field of water pollution control and shellfish. I see people here from New Jersey, from the Public Health Service, and we in the Federal Water Pollution Control Administration of the Department of the Interior have our experts here; so that if there are any questions or any problems that any of you want to bring up in connection with this problem, the subject we are going to consider today, I think we have about as much chance of providing you with the answers on any specifics today as with any group we are likely to have, so be sure and bring up your questions.

As specified in Section 10 of the Federal Water Pollution Control Act, the Secretary of the Interior has notified the official State water pollution control agency, which is the New Jersey State Department of Health, of this conference. This conference is between the official State agency and the U. S. Department of the Interior. The New Jersey State Department of Health may bring whomever it wishes to the conference and have them participate in the conference. However, only the representatives of the

Opening Statement - Mr. Stein

official State agency and the Interior Department constitute the conferees.

The State of New Jersey has designated as its conferee for this conference Dr. Roscoe P. Kandle. Mr. Lester M. Klashman has been designated as conferee for the Federal Government.

My name is Murray Stein. I am from Washington, D. C., headquarters of the U. S. Department of the Interior, and the representative of Secretary Udall.

Both the State and Federal governments have responsibilities in dealing with water pollution control problems. The Federal Water Pollution Control Act declares that the States have primary rights and responsibilities for taking action to abate and control pollution. Consistent with this, we are charged by law to encourage the States in these activities.

At the same time, the Secretary of the Interior is also charged by law with specific responsibilities in the field of water pollution control in connection with pollution of interstate and navigable waters. The Federal Water Pollution Control Act provides that pollution of interstate or navigable waters, whether the matter causing or contributing to the pollution is discharged directly into such waters, or reaches such waters after discharge into a tributary, which

Opening Statement - Mr. Stein

endangers the health or welfare of any persons, is subject to abatement.

The October 1965 amendments to the Federal Water Pollution Control Act additionally empower the Secretary of the Interior to initiate enforcement procedures whenever he finds that substantial economic injury results from the inability to market shellfish or shellfish products in interstate commerce because of pollution of interstate or navigable waters, and the action of Federal, State or local authorities.

This conference on pollution of the navigable waters of eastern New Jersey is the third to be held under these shellfish provisions of the Act.

Of course, as the representatives of the shellfish industry and some others know, we have a tremendous case in Puget Sound in Washington involving discharges from paper mills and the injury to the Pacific oyster industry, but this conference was called on the initiative of the Governor of the State of Washington.

The conference will cover the effects on interstate commerce caused by pollution of the shellfish beds in navigable waters of eastern New Jersey from Shark River to Cape May. We expect the conference will be useful in providing a clear picture of the problem, delineating the progress which has already been accomplished, and in indicating what needs to be

Opening Statement - Mr. Steir

done to correct the pollution problem in these navigable waters.

All the conferees will be called upon to make statements. The conferees, in addition, may call upon participants they have invited to the conference to make statements. In addition, we will call on any other interested individuals.

I would suggest that anyone from New Jersey wishing to make a statement get in touch with Dr. Kandle at the first recess, if you have not already done so.

At the conclusion of each statement, the conferees and myself will be given an opportunity to comment or ask questions. This procedure has in the past proven effective in developing the problem or reaching equitable solutions.

At the end of all the statements, we will have a discussion among the conferees and try to arrive at a basis of agreement on the facts of the situation presented here. Then we will attempt to summarize the conference orally, giving the conferees, of course, the right to amend or modify the summary.

Under the Federal law, the Secretary of the Interior is required at the conclusion of the conference to prepare a summary of it which will be sent to all the conferees. The summary must include the following points:

1. Occurrence of pollution of navigable waters

Opening Statement - Mr. Stein

subject to abatement under the Federal Act.

2. Adequacy of measures taken toward abatement of pollution and,

3. Nature of delays, if any, being encountered in abating the pollution.

The Secretary is also required to make recommendations for remedial action if such recommendations are indicated.

Now a word about the procedure governing the operation of the conference. A record and verbatim transcript of the conference is being made by Mr. Al Zimmer. This is made for the purpose of aiding us in preparing a summary, and also providing a complete record of what is said here.

We will make copies of the summary and transcript available to the official water pollution control agency of New Jersey.

Our experience has shown that the transcript will be available in about four months. Mr. Zimmer is a contract reporter. If any of you should feel the need for a transcript or a portion of it before that time, I suggest you get in touch with Mr. Zimmer and make your own arrangements with him, and I hope his charges will be as reasonable as those he charges us.

However, we have found that, generally, it is best

Opening Statement - Mr. Stein

that people who wish transcripts should request them through their State agency, rather than come directly to the Federal Government. The reason for this is that we would prefer people who are interested in the problem to follow their normal relations in dealing with the State agency rather than the Federal Government on these matters, when the conference has been concluded. This has worked successfully in the past and we will be most happy to make this material available to New Jersey for distribution.

I would like to ask that all speakers and participants other than the conferees making statements come to the lectern and identify themselves for purposes of the record.

Also, remember, you are speaking for a record. The record will appear in black and white. Try to keep in mind how this will look when someone reads the transcript. In other words, do not refer to something on a map as "the blue portion" or "the red portion," because that won't show up. It is also preferable that you not wave your hand and say, "that over there," because when someone reads the record a few months from now, they certainly won't know what you are pointing to, and you probably won't remember it either.

Also, if you have any prepared statements, it would be appreciated if you gave copies to the reporter and to the conferees before making your statement.

Opening Statement - Mr. Stein

Are there any comments from the conferees?

(No response.)

MR. STEIN: If not, we have been in touch with Senator Case of New Jersey before the conference. He had requested a conference of this type quite a while ago and he has been following this.

Because of pressing engagements in Washington, he will not be able to be present, but he has given one of our staff members, Mr. Henry Stetina, a copy of the statement, and he has asked that that be read into the record.

Mr. Stetina, will you come up and read Senator Case's statement, please?

STATEMENT OF HON. CLIFFORD P. CASE, UNITED
STATES SENATOR FROM THE STATE OF NEW JERSEY,
AS READ BY MR. HENRY STETINA, DEPARTMENT OF
THE INTERIOR

MR. STETINA: This is Senator Case's statement:

This Enforcement Conference is an important event for New Jersey. Our sea shore is one of our greatest assets -- it is of incalculable value to our State. It faces the greatest threat in its history. This threat is man-made -- it is water pollution.

Hon. C. P. Case

On August 23, 1966, in a letter to the Secretary of the Interior, I called attention to the fact that numerous bays and inlets along the New Jersey coast were being turned into cesspools by an outpouring of pollution from a variety of sources. I noted that bathing had been restricted and that the harvesting of shellfish had suffered a severe blow as a result of the pollution.

I urged the Secretary to invoke a provision of the Federal Water Pollution Control Act of 1965 which gives him authority to call an enforcement conference when he finds that municipal and other wastes have damaged shellfish to the extent they cannot be marketed in interstate commerce.

In April of this year, the Secretary responded by making such a finding and calling the enforcement conference we are attending today.

Since that time the proportions of the problem have been made clearer. In the April announcement, the Federal Water Pollution Control Administration, an arm of the Interior Department, said that shellfishing had been banned in more than 21,000 acres of New Jersey coastal water, and that damage to the State's shellfish industry was an estimated one million dollars a year.

In an extensive report made in September, however, FWPCA revised these figures upward. It now says shellfish

Hon. C. P. Case

harvesting is prohibited in 33,000 acres of water and that the estimated economic loss is 1.5 million dollars a year. Actually the figure may be closer to 3 million dollars if other factors, such as increased yield potential of tidal waters and retail value of the shellfish, are taken into account, the FWPCA report indicates.

The shellfish problem is of concern for more than just economic reasons. Contaminated clams or oysters are dangerous to health. Federal water pollution officials believe it quite possible that "poaching" on prohibited shellfish beds may occur from time to time and that contaminated shellfish may be taken and marketed for human consumption.

Accordingly, it is urgent that these shellfish areas be cleaned up -- and cleaned up completely. As the FWPCA report points out, it will not be enough to guarantee even 95 percent treatment of wastes destined for estuaries or tributary streams, as provided for by the recently adopted State water quality standards. The FWPCA states the need as follows:

"... to permit reopening of those areas presently closed to harvesting of shellfish ... it will be necessary for all waste discharges to be eliminated, since some danger of

Hon. C. P. Case

contamination exists even when adequate treatment is provided."

Pollution from inadequate waste treatment plants, overflow from individual septic tanks and cesspools, untreated discharge from pleasure boats and land drainage combine to foul coastal waters in the entire shellfish area which is the subject of this conference, namely, from Shark River in the north to Cape May in the south. If the pollution is to be reduced and finally eliminated, new and improved systems and patterns of waste treatment and disposal will have to be employed.

Admittedly, this will be expensive. Inevitably, the question will be asked: where will the necessary funds come from? While State and local government cannot escape their share, I long have felt the Federal Government can and must do more to ease the financial burden at the local level in this field. And as a member of the Senate Appropriations Committee, I have supported increased appropriations for Federal water pollution programs.

Last year, for example, I joined in sponsoring a multibillion dollar measure which the Senate first initiated and Congress approved in somewhat scaled down, but still acceptable, form.

In the current Congress I supported appropriation

Hon. C. P. Case

for the entire 450 million dollars authorized for waste treatment plant construction in fiscal 1968. I believe it would have been possible to secure the entire amount had the Administration pressed for it, instead of asking for only half the amount.

This conference should be regarded as more than a routine procedural step preliminary to assessing penalties against violators of the Federal anti-water pollution laws. The conference also provides a way by which we can develop a cooperative approach among all levels of government in dealing affirmatively with a problem of common concern.

I remind you that the enforcement conference has a good record of success in this regard. Thirty-nine or more previous Federal enforcement conferences in the water pollution field have produced affirmative voluntary action by the parties concerned. I know I share a common hope that this one will be no less successful.

MR. STEIN: Thank you, Mr. Stetina.

I know Senator Case has been long interested in this program nationally, and particularly in clean waters for New Jersey.

This is one of the characteristics of our program, that it is truly a bipartisan one. We certainly appreciate Senator Case's interest.

K. Walker

Thank you very much.

Do we have any other Congressional representatives?

(No response.)

MR. STEIN: If not, we will call on Mr. Klashman, the Regional Director for the Federal Water Pollution Control Administration, for the Federal report.

Mr. Klashman?

MR. KLASHMAN: Thank you, Mr. Stein.

I first would like to introduce my colleague, for those of you who might not possibly know him, Mr. Paul DeFalco, who is our Deputy Regional Director in charge of our subregional office at the North Atlantic Water Quality Management Center in Metuchen, New Jersey.

Mr. DeFalco.

The first presentation will be given by Mr. Kenneth Walker, Deputy Director of the Hudson-Champlain Project.

Mr. Walker.

STATEMENT OF KENNETH WALKER, DEPUTY
DIRECTOR, HUDSON-CHAMPLAIN PROJECT,
FEDERAL WATER POLLUTION CONTROL AD-
MINISTRATION, DEPARTMENT OF THE
INTERIOR, METUCHEN, NEW JERSEY

K. Walker

MR. WALKER: My name is Kenneth Walker. I am Deputy Director of the Hudson-Champlain Comprehensive Study of the Federal Water Pollution Control Administration, located at Metuchen, New Jersey.

Mr. Stein, for purposes of this presentation, I will be abbreviating portions of our formal report. However, I would like to request that the entire report be placed into the record.

MR. STEIN: Without objection, the report will be entered into the record as if read in its entirety.

MR. WALKER: Thank you.

REPORT ON
POLLUTION OF THE NAVIGABLE WATERS
OF
EASTERN NEW JERSEY
SHARK RIVER TO CAPE MAY

U. S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMINISTRATION
NORTHEAST REGION
NORTH ATLANTIC WATER QUALITY MANAGEMENT CENTER
Metuchen, New Jersey
September 1967

"..... an impressive body of evidence points to the low-lands bordering the sea coasts as an area where pollution problems merge and concentrate. In this area contamination which is deleterious to fish and wildlife resources is rarely if ever a purely local problem;....."

The President's Science Advisory Committee

November 1955

K. Walker

CONCLUSIONS AND RECOMMENDATIONS

1. This report covers the estuaries and tributaries of Eastern New Jersey, from Shark River on the north to Cape May on the south. These waters receive the discharge of wastes from municipal waste treatment plants, individual septic tanks and cesspools, recreational boats and land drainage. As a result, these waters are polluted by bacteria, suspended solids and nutrients.
2. Because of the existing or potential pollution of these waters, the State of New Jersey, under the cooperative arrangements governing the National Shellfish Sanitation Program, has closed more than 33,000 acres of water to the direct harvesting of shellfish. These closures have caused substantial economic injury resulting from the inability to market shellfish or shellfish products in interstate commerce. The estimated economic loss to the region is at least \$1.5 million annually.
3. Accordingly, the pollution of these navigable waters is subject to abatement under the provisions of Section 10 of the Federal Water Pollution Control Act, as amended.
4. In addition to constituting a health hazard via shellfish, the bacterial contamination of these waters

constitutes a hazard to the health and welfare of persons utilizing these waters for recreation.

5. The pollution of these waters by suspended solids and nutrients has resulted in an unsightly appearance, the production of objectionable odors, and excessive growths of algae and other aquatic plants. These conditions limit the use of these waters for recreational bathing, boating, and esthetic enjoyment.

6. Municipal and institutional waste discharges constitute the major sources of pollution of these waters. Although all significant sources of such waste provide some form of treatment, many of the existing treatment facilities do not provide effective removal or control of pollutants due to inadequate design or operation. The 98 known municipal and institutional discharges impose a loading of 125,000 pounds per day of BOD (Biochemical Oxygen Demand) on the waters of the area.

7. Other sources of pollution to these waters include overflow or seepage from cesspools and septic tanks, the discharge of waste from recreational boats, and surface or groundwater runoff of agricultural chemicals. At the present time, due to the limited number of industries, industrial waste does not represent a significant source of pollution in this area.

8. Pollution of these waters is complicated further by natural hydrographic conditions. Many of the bays have very restricted connections with the ocean. As a result of this lack of available circulation, pollutants are not readily flushed from these waters, which further increases the degradation of water quality.

9. The New Jersey State Department of Health has adopted water quality standards for the waters covered by this report, and has submitted the standards to the Secretary of the Interior for approval as Federal water quality standards under the provisions of Section 10 of the Federal Water Pollution Control Act, as amended. These standards require that all wastes discharged to the Atlantic Ocean receive, as a minimum, treatment that will provide at all times 85 percent removal of BOD, and that all wastes discharged to the estuaries or tributary streams receive a minimum treatment at all times of 95 percent removal of BOD. Abatement orders issued under these standards further require effective year-round disinfection, with construction to be undertaken in accordance with the following schedule:

- a. Preliminary plans for treatment or for upgrading of facilities to be submitted on or before October 30, 1968;
- b. Final construction plans to be submitted on

or before and approved by June 1, 1969;

- c. Construction to be initiated on or before October 1, 1969 and to be completed on or before November 30, 1970.

10. The treatment requirements and time schedule established by these standards and orders represent a significant step in pollution abatement. However, to permit reopening of those areas presently closed to the harvesting of shellfish under the National Shellfish Sanitation Program, it will be necessary for all waste discharges to be eliminated, since some danger of contamination exists even when adequate treatment is provided. Construction of waste treatment systems which provide adequate treatment prior to discharge through a limited number of outfalls into the estuaries or through outfall lines extended into the Atlantic Ocean should be considered an approach that may permit opening areas now closed to the harvesting of shellfish. As an alternate, construction of advanced waste treatment facilities with groundwater recharge of the effluent would have the additional benefit of preserving or enhancing the groundwater supply.

11. Since the existence of individual septic tanks and cesspools also requires closure of adjacent

K. Walker

shellfish harvest areas under the National Shellfish Sanitation Program, the elimination of such individual facilities would enable more utilization of these harvest areas. Steps should be taken to restrict proliferation of individual sub-surface disposal systems by more stringent control of subdivision construction.

12. Control measures aimed at abating pollution from recreational boats operating in the tidal waters of the area should be adopted by the State of New Jersey. Such control measures should require either adequate treatment facilities aboard vessels equipped with toilets, or holding tanks capable of holding waste material for subsequent discharge to on-shore treatment facilities. Such regulations should be adopted so that pollution from this source will be controlled no later than January 1, 1970.

13. To insure that water pollution control plants operate at maximum efficiency it is essential that proper operation and maintenance be provided. To this end qualified licensed operators should be in residence at each treatment plant and adequate facilities and procedures should be established to provide proper laboratory control at each plant.

K. Walker

I. INTRODUCTION

Description of Area

The area covered by this report extends from Shark River on the north to Cape May on the south, and embraces the navigable estuaries and tributaries of the Atlantic Coastal Area of New Jersey. It includes Shark River and inlet, Manasquan River and inlet, the Intracoastal

Waterway, and the various bays, harbors, and streams tributary to the waterway. These waters have a surface area of more than 125,000 acres.

With the exception of Shark River and a portion of Minasquan River, which are in Monmouth County, and a portion of Mullica River in Burlington County, the waters of the area lie within three counties: Ocean, Atlantic and Cape May. As only a very limited portion of Monmouth and Burlington Counties is included in this area, discussions of population, economics and similar factors are restricted to Ocean, Atlantic and Cape May Counties.

Geology

On the basis of ground water occurrence, New Jersey can be divided into two major geological provinces: The highland Appalachian Valley and the Atlantic Coastal Plain. 1/ A "fall line", stretching from Trenton to Perth Amboy, separates the Atlantic Coastal Plain from the northern ground water province. The area under discussion is entirely underlain by the Atlantic Coastal Plain Province.

The Atlantic Coastal Plain Province is a south-eastward-thickening wedge made up of deposits of unconsolidated clay, silt, sand, gravel and marl of Cretaceous and Tertiary age. The wedge has a southeastward dip of

about 100 feet per mile. The coarser beds in these deposits are very favorable for the storage and movement of ground water. A band six to ten miles wide along the coast identifies the area susceptible to saltwater contamination. 2/

The topography of the Coastal Plain has relatively low relief. Most of the Plain lies between sea level and the 200-foot contour.

Population and Economy

The resident population in the three-county area numbered 317,576 persons in 1960, and is estimated to have increased to 382,850 by 1966, a growth of approximately 3.4 percent each year, compared with a statewide annual rate of 2.5 percent. 3/ Atlantic County is the most populous, with slightly less than half of the area's residents. Ocean County registered the swiftest population rise, approximately 39 percent in the six-year period, 1960-1966. More than three-quarters of the inhabitants in the study area live in the cities and other municipalities fronting the Atlantic or located along the coastal bays and inlets.

An internationally famous resort area, the "Jersey Shore" attracts millions of tourists and vacationers throughout the year. During the summer season the population

swells to more than triple its winter size. The following data illustrate the enormous influx of summer visitors to several large and small resort centers. This seasonal variation requires that all forms of public facilities be sufficiently flexible to provide increased services during the summer, yet operate efficiently during off-peak periods.

SEASONAL POPULATION CHANGES AT SELECTED

COASTAL COMMUNITIES 1964

<u>Resort</u>	<u>Normal</u>	<u>Summer</u>	<u>Population Increase</u>	
	<u>Population</u>	<u>Population</u>	<u>Net Gain</u>	<u>Percent</u>
Atlantic City	60,400	210,000	149,000	248
Ocean City	7,730	150,000	142,270	1,840
Wildwood City	4,680	125,000	120,320	2,571
Ship Bottom	750	16,000	15,250	2,033
Surf City	<u>450</u>	<u>13,000</u>	<u>12,550</u>	<u>2,782</u>
TOTALS	74,010	514,000	439,990	595

Source: New Jersey State Navigation Bureau. 4/

It should be noted that the summer population gain of 439,990 for the five resorts listed above is larger than the total resident population for the three-county area,

382,850. There are many other resort communities in the area which experience equally dramatic increases in summer population.

An analysis of the employment pattern (wage and salary employment covered by Social Security) in the three-county coastal area also characterizes it as a leading resort region. 5/ More than half of those employed are engaged in trade and service activities. Even in mid-March, the data of Census enumeration, these counties provided 43 percent of the State's total employment in hotels, motels and other lodging places. Summer employment at these facilities rises significantly to accommodate the needs of thousands of guests visiting the "Jersey Shore."

Employment in the area is growing faster than in the State as a whole. Although total employment in New Jersey advanced 23 percent between 1956 and 1966, employment in the three-county area grew at almost twice the State rate, with an increase of 44 percent. The area accounted for only four percent of the State's total covered employment, but in several major employment sectors it had a relatively high ratio of the State total. Such sectors include: agricultural services, forestry and fisheries, 15 percent of the State total; contract construction, 9 percent; services, 6.3 percent and retail trade, 6 percent.

Another economic measure demonstrating the attraction of this area as a vacation and recreation area is the proportion of seasonally vacant housing units within its outline, which is one of the best qualitative measures of an area's recreational development. With only nine percent of the State's total housing units, the three-county area monopolized 61 percent of New Jersey's total seasonally vacant housing units.

On the basis of employment, the area includes the majority of the New Jersey fin and shellfish industry. According to the Fish and Wildlife Service of the U. S. Department of the Interior, New Jersey had 3,789 fin and shellfishermen in 1965, two-thirds of whom worked in the three-county area. 6/ Of this total, approximately 1,000 fishermen were classified as casual (fishermen who earn less than half of their income in the fishing industry).

II. HYDROGRAPHY

New Jersey has a very uniform long-term average monthly precipitation with about 8 percent of the annual average occurring each month. Average annual precipitation in southern New Jersey is about 45 inches.

Although precipitation during drought conditions may be only a third or half of the maximum rainfall month,

the stabilizing effect of ground water storage in the Coastal Plain results in a noticeably greater sustained dry season runoff in the headwaters region of the Batsto and Toms Rivers. 7/

The New Jersey coastal estuaries are characterized by very restricted connections with the ocean. The average depth over their barrier bars is from three to five feet (except for Cape May and Little Egg Inlets), and the bars are made impassable by breakers on many occasions. The greatest tidal current velocities are found in the inlets and may reach three knots. 8/

The northern estuaries, inside the inlets, are relatively broad and shallow, and their normal tidal current pattern and range may be greatly modified by the wind. In Barnegat Bay, for example, normal tidal range is about half a foot away from the inlets, and four feet on the ocean side, but during strong winds of long duration may vary by as much as three feet above and below normal maximum levels. The southern estuaries are characterized by relatively narrow, twisting channels connecting shallow, sedgy sounds. Their circulation is quite restricted.

A dye study in Barnegat Bay by Carpenter (1965) indicated a residence time of roughly five days, a tidal excursion of about one mile, and typical bay water velocities

of several tenths of a knot. 9/ Federal Water Pollution Control Administration drogue studies made in 1966 indicate elliptical particle trajectories over a tidal cycle and appeared to confirm Carpenter's conservative speed and excursion values. The tide provides most of the energy for circulation, although water from Toms River contributes to a general southerly drift.

New Jersey State Department of Health studies conducted south of Atlantic City from 1960 to 1967 show tidal excursions of about 2.5 miles near the inlets on the larger bays and sounds and about 1.5 miles in the more restricted sounds and channels well away from the inlets. Immediately outside the inlets, the major sand transport is northward along the coastline. Recent Federal Water Pollution Control Administration studies served to confirm New Jersey's work in the area. Drift bottle studies by Bumpus and Lauzier in 1965 showed that a combination of eddies, tidal currents and net drift exerts a shoreward component of current during the summer bathing season. 10/ Sea bed drifter returns suggest bottom currents with a shoreward component of several tenths of a mile per day. 11/

As a result of this limited circulation, residence time of pollutants in many of the bays and inlets is increased, which results in further degradation of water quality.

III. WATER USES

Water Supply

An inventory of municipal and institutional water supplies in the three-county study area was conducted in 1966. The results, shown in Table 1, indicate significant seasonal variation in demand. There are 51 systems supplying 29 MGD (million gallons per day) in the winter. Demand in the summer increases to 77 MGD. The majority of the systems are small in size. Only nine systems supply 1.0 MGD or more during the winter months.

All of these systems rely on ground water sources, although Atlantic City utilizes a supplemental surface water source during period of peak demand.

Industry is generally supplied by the systems described above, and according to one estimate, utilizes about 5 MGD of the total municipal supply. ^{12/} The only major self-supplied industry in the area is Toms River Chemical Co., which utilizes 3 to 4 MGD of ground water for process purposes, and an additional 13 MGD of Toms River water for cooling.

Recreational Bathing

Recreational bathing, most of which is along the

ocean, represents an important water use and economic factor in the New Jersey Coastal Area. Table 2 presents data on the number of visitors at each of the 31 public bathing areas in the three counties for 1964. Use amounted to 45,300,000 visitor-days, evenly distributed throughout the three counties. These figures are for public beaches only, and do not include the extensive use of private beaches where no records are maintained.

The Federal Ad Hoc Water Resources Council has suggested that a minimum value of \$.50 per visitor-day provides a conservative estimate of the economic value of this industry. ^{13/} Using this guideline, recreational bathing has a minimum value of nearly \$22,700,000 annually in the three-county area. This figure, however, is a minimum and does not represent the full economic benefit associated with recreational bathing in this region. As a resort area, much of the region's economy derives from activities associated with forms of recreation, such as bathing. In 1962, for example, it is estimated that wages paid to employees of hotels, motels, eating and drinking establishments in the three-county area amounted to nearly \$24,000,000.

Recreational Boating

Boating is another important factor in the

economy of the New Jersey Coastal Area. From Manasquan River to Cape May there are 260 known marinas or dock facilities for recreational boating. ^{14/} Two-thirds of these are located north of Great Bay.

One of the attractions of the Atlantic Coastal counties to the boating enthusiast is the New Jersey Intracoastal Waterway. Small craft (draft four feet or less) can cruise protected waters from Manasquan Inlet to Cape May Inlet and then proceed by canal to Delaware Bay and the National Intracoastal Waterway.

In 1966, New Jersey issued 130,000 motor boat licenses. In addition, there are 200,000 boats in the New York City-Long Island area, many of which cruise the New Jersey Intracoastal Waterway. ^{15/}

Commercial Finfishing

Commercial finfishing is an important industry in New Jersey, although the catch value has declined over the past decades. The 1966 catch, with a value of \$3.0 million, was only one-third of the 1956 catch. ^{16/} The relative importance of finfishing to the total New Jersey fish catch (finfish plus shellfish) has also sustained a similar downward trend, from 62 percent of the total take in 1956 to 31 percent in 1966. In comparison, the United States

total harvest of finfish has remained relatively unchanged for the last eleven years, with an annual value of \$200 million.

Although the finfishing industry in New Jersey as a whole has slumped sharply, the three-county area reported an advance of 15 percent, during the same period, from \$2 million in 1956 to \$2.3 million in 1966. In terms of relative share of the State's total catch, the area now accounts for slightly more than one-third of the total finfish harvest as compared with one-fifth eleven years earlier.

Commercial Shellfishing

The New Jersey shellfish industry services a significant portion of the Northeast market. In 1956, the area accounted for 40 percent of the New Jersey shellfish output, which had a total landing value of \$5.7 million. ^{16/} In 1966, this same area contributed 82 percent of the State's total shellfish catch valued at \$6.7 million. This increased contribution by the area to the State's total shellfish take is due to the increasing harvest of the surf clam, a mollusk found in the moderately deep ocean waters. The value of the surf clam harvest in the three counties rose by 208 percent in ten years, from \$1.2 million in 1956 to \$3.7 million in

1966, with all of the gain taking place off Ocean County.

In contrast to the accelerated harvest of the surf clam, the landing value of hard clams, soft clams and oysters in New Jersey declined from \$3.6 million in 1956 to \$2.0 million in 1966. Expressed in relative shares of the industry, the value of the hard clam, soft clam and oyster harvest fell from 63 percent of the total shellfish output in 1956 to 30 percent of the total in 1966.

Hence, although the New Jersey shellfish industry has shown a moderate gain of 17 percent in value of output in the period selected for analysis, (1956-1966), the direct market harvest of hard and soft clams and oysters has declined, due primarily to pollution in the case of clams and to natural disease in the case of oysters.

TABLE 1

MUNICIPAL & INSTITUTIONAL WATER SUPPLY SYSTEMS
WATER CONSUMPTION - N. J. COASTAL BASIN

Water Facility by County	:	Consumption - mgd	
		Winter	Summer
A. <u>OCEAN COUNTY</u>			
1. Barnegat Light Municipality		0.08	0.35
2. Bay Head Municipality		0.40	1.65
3. Beachwood Municipality		0.10	0.18
4. Beach Haven Municipality		0.20	1.00
5. Arlington Beach Water Company		0.04	1.12
6. Bayville Water Company		0.03	0.03
7. Shore Water Company		0.06	0.16
8. Toms River Water Company		1.90	1.90
9. Harvey Cedars Municipality		0.06	0.31
10. Island Heights Municipality		0.18	0.30
11. Jackson Township Municipality		0.60	0.70
12. Lakehurst Municipality		0.12	0.30
13. Lakewood Water Company		1.00	1.20
14. South Lakewood Water Company		0.03	0.14
15. Lavallette Municipality		0.15	0.80
16. Mystic Isles Water Company		0.08	0.45
17. Long Beach Water Company		0.25	1.50
18. Long Beach Township Municipality		0.05	0.15
19. Cedar Glen City		0.10	0.10
20. Ocean Gate Municipality		0.09	0.30
21. Pine Beach Municipality		0.10	0.10
22. Point Pleasant Municipality		1.50	2.50
23. Point Pleasant Beach Municipality		0.60	2.00
24. Seaside Heights Municipality		0.30	2.89
25. Seaside Park Municipality		0.10	1.62
26. Ship Bottom Municipality		0.20	0.79
27. Stafford Water Company		0.10	0.28
28. Surf City Municipality		0.10	0.67
29. Tuckerton Water Company		0.04	0.50
Total Ocean County		8.56	22.99
B. <u>ATLANTIC COUNTY</u>			
1. Atlantic City Municipality		10.00	20.00
2. Atlantic County Water Company		1.80	5.60
3. Brigantine Municipality		0.51	1.13
4. Egg Harbor City Municipality		0.35	0.50
5. Hamilton Township Municipality		0.25	0.25
6. Hammonton Municipality		0.90	2.00
7. Longport Municipality		0.25	0.80
8. Margate Municipality		1.00	2.00
9. Atlantic County Hospital		0.04	0.09
10. Ventnor Municipality		1.07	2.35
Total Atlantic County		16.17	34.72
C. <u>CAPE MAY COUNTY</u>			
1. Avalon Municipality		0.15	1.20
2. Cape May Municipality		0.70	2.10
3. Lower Township Water Company		-	-
4. Crest Haven Home		0.01	0.01
5. Neptunus Water Company		0.18	0.18
6. Ocean City Water Company		1.00	5.20
7. Sea Isle City Municipality		0.25	1.00
8. Stone Harbor Municipality		0.45	0.85
9. Corson's Inlet Water Company		0.08	0.12
10. Wildwood Municipality		1.00	7.40
11. N. J. Colony @ Woodbine		0.20	0.20
12. Woodbine Water Company		0.30	0.90
Total Cape May County		4.32	19.16
TOTAL THREE COUNTIES		29.05	76.87

Resort Centers and Municipalities by County	Estimated Population Normal (Resident)	Summer	Beach Use Weekdays	Beach Use Weekends	Total Beach Use
Atlantic County					
Atlantic City	60,400	210,000	110,000	150,000	14,800,000 ^{b/}
Brigantine city	4,590	15,000	1,500	3,000	165,000
Long Port borough	1,060	8,000	600	1,500	73,500
Margate city	10,000	30,000	5,000	12,000	600,000
Ventnor city	8,900	20,000	7,000	20,000	920,000
Total	80,950	283,000	124,100	186,500	17,618,500
Cape May County					
Avalon borough	810	16,000	8,000	12,000	780,000
Cape May City	4,600	25,000	15,000	28,000	1,600,000
Cape May Point borough	280	2,300	750	1,800	90,000
Lower Township	7,110	20,000	318	650	35,330
North Wildwood city	3,670	48,000	35,000	40,000	2,100,000
Ocean City	7,730	150,000	25,000	40,000	2,500,000
Stone Harbor borough	860	25,000	10,000	15,000	975,000
Sea Isle City	1,380	22,000	10,000	18,000	1,050,000
Upper Township	2,690	4,000	1,500	3,500	177,500
Wildwood city	4,680	125,000	45,000	75,000	4,575,000
Wildwood Crest borough	3,270	20,000	17,600	23,100	1,633,500
Total	37,080	457,300	166,168	257,050	18,116,330
Ocean County					
Barnegat Light borough	320	10,000	4,000	7,000	415,000
Bay Head borough	820	5,000	2,500	4,000	250,000
Beach Haven borough	1,060	22,000	2,000	5,000	245,000
Berkeley Township	5,240	10,000	100	500	18,500
Brick Township	20,830	65,000	1,000	2,500	122,500
Dover Township	22,070	35,000	1,500	3,000	165,000
Harvey Cedars	140	5,500	2,750	3,500	252,500
Lavallette borough	840	25,000	9,000	12,000	840,000
Long Beach Township (all four parts)	1,770	35,000	20,000	25,000	1,625,000
Mantoloking borough	180	1,600	400	500	36,500 ^{c/}
Pt. Pleasant Beach borough	4,140	35,000 ^{c/}	20,000	25,000	1,325,000
Seaside Heights borough	970	33,000	12,800	27,500	1,455,500
Seaside Park borough	1,060	25,000	18,591	37,182	2,045,010
Ship Bottom borough	750	16,000	22,800	32,600	2,183,000
Surf City borough	450	13,000	5,000	8,000	400,000
Total	60,640	336,100	122,441	193,282	12,172,510
Grand Total	182,670	1,076,400	414,709	636,832	45,211,340

a/ Total beach use was arrived at by multiplying the "Beach Use Weekdays" figure by 60 and the "Beach Use Weekend days" by 25, a period encompassing 85 days from June 15 to September 7, 1964. An estimation method developed by the New Jersey State Navigation Bureau.

b/ Total beach use for Atlantic City was compiled for the period from June 1 through September 30.

c/ No Beach Use Report - Estimate based on Long Beach Center, with like summer population.

Source: New Jersey State Navigation Bureau

IV. SOURCES OF POLLUTION

The New Jersey coastal waters serve as a receiving body for the discharge of wastes from municipalities, institutions, industry, individual cesspools and septic tanks, recreational boating and, to a lesser degree, surface runoff and agricultural land drainage.

Municipal and Institutional Wastes

Municipal and institutional waste discharges constitute the greatest source of pollution within the New Jersey Coastal Basin. Many of these sewage systems are subjected to large seasonal load variations, which are due to an increase in the resident and transient population during the summer recreational period. As a result, a number of water pollution control plants are overloaded or operate at capacity during the summer.

A recent Federal Water Pollution Control Administration survey of municipal and institutional wastes discharged into the New Jersey Coastal Basin between the vicinity of Shark River and Cape May found that: 17 sources discharge directly into the Atlantic Ocean; 35 discharge directly into the estuary (shellfish waters); 45, including three Federal installations, discharge to tributary streams.

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These figures include small "package plants" which are defined as prefabricated units with design flows less than 150,000 gallons per day.

Information for these waste sources is summarized in Table 3. The locations of the sources listed are shown by county in Figures 1, 2 and 3. Of the 98 facilities listed: 36 serving 836,000 persons provide primary treatment or less, 35 serving 60,000 persons provide intermediate treatment and 27 serving 121,000 persons provide secondary treatment. Chlorination facilities are provided for all of the systems shown in Table 3.

MR. STEIN: Pardon me, Mr. Walker. What do you mean by "intermediate treatment"?

MR. WALKER: These are defined at the foot of Table 3.

Primary treatment is that which provides primary settling with a maximum of 35 percent biochemical oxygen demand removal. Intermediate treatment is that which provides something more than primary, but something less than full biological treatment, which is the secondary treatment level.

MR. STEIN: I still don't know what you mean. I am fascinated by the "intermediate treatment."

MR. WALKER: Well, in terms of BOD removals, and

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these definitions were set up for the basis of evaluating the loads, the primary, for this purpose here, is 35 percent biochemical oxygen demand removal, intermediate is up to 70 percent, and secondary is up to 85 percent.

MR. STEIN: I see.

MR. WALKER: Primary is just primary settling provided, and secondary treatment includes primary settling, full-scale biological treatment, with secondary settling.

MR. STEIN: Could you give an example of intermediate?

MR. WALKER: Intermediate could be primary settling plus possibly a small sand filtration unit, or chlorination.

MR. STEIN: Thank you.

MR. KLASHMAN: Mr. Walker, you also were referring to some cases where you might have some form of supplemental aerator, but not enough to give a BOD removal above 70 percent, weren't you?

MR. WALKER: Yes.

MR. KLASHMAN: All right.

MR. STEIN: Thank you.

MR. WALKER: The BOD (biochemical oxygen demand) loadings discharged by these systems are summarized below. Of the total load of 125,000 pounds of BOD per day, over 65

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percent is discharged to the shellfish waters. Less than three percent of the load is imposed upon the tributary waters.

MUNICIPAL AND INSTITUTIONAL WASTE LOADINGS TO STUDY AREA

<u>Receiving Water</u>	No. of <u>Plants</u>	Est. Summer <u>Pop. Served</u>	Est. Pounds <u>BOD/day</u>
Atlantic Ocean	17	290,000	40,000
Estuary (Shellfish Waters)	35	658,000	81,000
Tributaries	46	78,000	3,700
Totals	98	1,026,000	124,700

TABLE 3

MUNICIPAL AND INSTITUTIONAL WASTE DISCHARGES
NEW JERSEY COASTAL BASIN
(SHARK RIVER TO CAPE MAY)

Ident. No.	Municipality by County and Major Discharge Water	Receiving Waters	Est. Pop. (Summer)	Degree of Treatment	FLOW - MGD			ESTIMATED BOD LOADINGS ^a (lbs/day)			Orders Issued
					Design	Actual Summer		Influent	Percent Removal	Effluent	
MONMOUTH COUNTY (See Figure 1)											
I. Systems Discharging Directly to Atlantic Ocean											
1.	Belmar and S. Belmar	Atlantic Ocean	30,000	Primary	2.5	1.2		6,000	35	3,900	Yes
2.	Spring Lake Heights	Atlantic Ocean	8,000	Primary	3.5	0.2		1,600	35	1,000	Yes
3.	Spring Lake Boro #1	Atlantic Ocean	12,000	Primary	1.5	0.7		2,400	35	1,600	Yes
4.	Spring Lake Boro #2	Atlantic Ocean	700	Primary	0.1	Unk		200	35	100	Yes
5.	Sea Girt	Atlantic Ocean	3,000	Primary	0.5	0.2		600	35	400	Yes
6.	Manasquan	Atlantic Ocean	12,000	Primary	1.0	0.3		3,600	35	2,400	Yes
II. Systems Discharging Directly to Shellfishing Waters											
7.	Brisbane Child Center (Allaire)	Brisbane Lake		Primary	Unk	0.02		40	35	30	No
8.	Wall Twp. N.J. Highway Auth.	Manasquan River	200	Second.	0.03	0.02		400	85	60	Yes
9.	Wall Twp. Allenwood Hospital	Manasquan River	200	Inter.	0.04	0.02		40	70	10	No
III. Systems Discharging Indirectly to Shellfishing Waters											
10.	Camp Evans (Federal)	Shark River	300	Primary	0.6	0.03		100	85	15	No
11.	Freehold Boro	Tributary to Manasquan River	10,000	Second.	0.8	0.7		2,000	85	300	Yes
12.	Freehold Twp. (Freehold Sewer Company)	Tributary to Manasquan River	1,100	Inter.	0.3	0.2		200	70	100	Yes
13.	Freehold Twp. (Wynnewood Sewer Company)	Tributary to Manasquan River	1,000	Second.	0.2	0.1		325	70	95	Yes
14.	South Freehold Regional H.S.	Manasquan River	300	Inter.	0.06	0.01		60	70	20	Yes
15.	Howell Twp. (Maxim Sewer Co.)	Tributary to N. Branch Metedeconk	4,000	Inter.	0.4	0.2		670	88	85	Yes
16.	Freehold Twp. Silvertrailers	Tributary to Manasquan River	Na	Second.	0.03	Na		Na	85	Na	Yes
17.	Freehold Twp. Stonehurst	Br. to Manasquan	Na	Second.	0.3	Na		Na	85	Na	Yes
18.	Howell Twp. Cricket Rest.	N.Br. Metedeconk	Na	Second.	0.006	Na		Na	85	Na	Yes

OCEAN COUNTY (See Figure 1)

I. Systems Discharging Directly to Atlantic Ocean

19.	Point Pleasant Beach	Atlantic Ocean	15,000	Primary	1.5	0.8		3,000	35	2,000	Yes
20.	Bay Head	Atlantic Ocean	6,000	Primary	0.5	0.4		1,200	35	800	Yes
21.	Lavallette	Atlantic Ocean	5,000	Primary	0.9	0.8		1,000	35	700	Yes
22.	Dover Twp. Ortleigh Beach	Atlantic Ocean	7,000	Primary	2.6	1.1		2,500	54	1,150	Yes

TABLE 3

MUNICIPAL AND INSTITUTIONAL WASTE DISCHARGES
NEW JERSEY COASTAL BASIN
(SHARK RIVER TO CAPE MAY) (Cont'd)

Ident. No.	Municipality by County and Major Discharge Water	Receiving Waters	Est. Pop. (Summer)	Degree of Treatment	FLOW-MGD		ESTIMATED BOD LOADINGS ^{a/} (lbs/day)		Influent	Percent Removal	Effluent	Ordered Issued
					Design	Actual	Influent	Effluent				
OCEAN COUNTY (Cont'd.)												
23.	Seaside Heights	Atlantic Ocean	50,000	Primary	1.7	1.5	10,000	35	6,500	Yes		
24.	Seaside Park	Atlantic Ocean	35,000	Primary	1.0	1.3	7,000	20	5,600	Yes		
25.	Berkeley Twp. Sewerage Auth. (S. Seaside Park)	Atlantic Ocean	500	Inter.	0.4	0.1	100	70	30	Yes		
26.	Surf City	Atlantic Ocean	15,000	Primary	0.7	0.4	8,000	35	2,000	Yes		
27.	Ship Bottom	Atlantic Ocean	20,000	Primary	1.2	0.4	4,000	35	2,600	Yes		
28.	Long Beach Twp.	Atlantic Ocean	50,000	Primary	2.0	1.3	10,000	35	6,500	Yes		
29.	Beach Haven	Atlantic Ocean	15,000	Primary	0.6	0.9	3,000	20	2,400	Yes		
II. Systems Discharging Directly to Shellfishing Waters												
30.	Dover Sewerage Auth. (Toms River Plant)	Toms River	4,000	Primary	0.4	0.5	800	35	500	Yes		
31.	Island Heights Boro	Toms River	3,700	Second.	0.4	0.1	700	85	100	Yes		
32.	Berkeley Twp. Municipal (Clammeg Creek)	Clammeg Cr.	500	Inter.	0.3	0.1	100	70	30	Yes		
33.	Tuckerton Municipal	Barnegat Bay	7,000	Inter.	0.5	0.2	1,400	70	400	Yes		
34.	Little Egg Harbor Twp. (Nystic I. Sewer Co.)	Big Creek	7,000	Inter.	0.5	0.2	1,400	70	400	Yes		
35.	Lacey Twp. N.J. Highway Auth.	Forked River	200	Inter.	0.04	0.02	40	70	10	Yes		
36.	Lacey Twp. Forked River Marina	Forked River	Na	Primary	0.01	Na	Na	35	Na	Yes		
37.	Point Pleasant Boro Bd. of Ed.	Bay Hd.-Manasquan Can.	Na	Inter.	0.02	0.01	Na	70	Na	Yes		
38.	Berkeley Twp.-Berkeley Shores	Barnegat Bay	250	Inter.	0.3	Na	Na	70	Na	Yes		
39.	Berkeley Twp.-Bd. of Ed.	Barnegat Bay	Na	Inter.	0.01	Na	Na	70	Na	Yes		
40.	Dover Twp.-Toms R. Bd. of Ed.	Applegate Cove	Na	Inter.	0.04	Na	Na	70	Na	Yes		
II. Systems Discharging Indirectly to Shellfishing Waters												
41.	Jackson Twp. Municipal (Brookwood #3)	North Branch Metedeconk	1,200	Inter.	0.3	0.1	375 ^{d/}	87	50 ^{d/}	Yes		
42.	Jackson Twp. Municipal (Brookwood #1)	North Branch Metedeconk	2,000	Inter.	0.1	0.2	670 ^{d/}	75	165 ^{d/}	Yes		
43.	Lakewood Boro (Lakewood Water Co.)	South Branch Metedeconk	12,500	Second.	1.9	2.0	13,000 ^{d/e/}	90	1,300 ^{d/}	Yes		
44.	Jackson Twp. Municipal (Brookwood #2)	South Branch Metedeconk	1,000	Inter.	0.1	0.1	290 ^{d/}	86	42 ^{d/}	Yes		
45.	Jackson Twp. (Harmony Sewer Co.)	South Branch Metedeconk	700	Inter.	0.1	0.04	210 ^{d/}	95	10 ^{d/}	Yes		

TABLE 3

MUNICIPAL AND INSTITUTIONAL WASTE DISCHARGES
NEW JERSEY COASTAL BASIN
(SHARK RIVER TO CAPE MAY) (Cont'd)

Map Ident. No.	Municipality by County and Major Discharge Water	Receiving Waters	Est. Pop. (Summer)	Degree of Treatment	Flow- Rate (Actual Summer)	ESTIMATED BOD LOADINGS (lbs/day)	Percent Removal	Influent Effluent	Orders Issued
OCEAN COUNTY (Cont'd)									
46.	Lakewood (Leisure Village)	Kettle Creek	700	Inter.	0.3	0.03	36	390 d/	54 d/ Yes
47.	Lakehurst Municipal	Barnegat Bay							
48.	Lakehurst Naval Air Sta. (Fed.)	Tributary to S. Br. Tom R. Ridgeview Br.	1,500	Second.	0.5	0.1	85	500	50 Yes
49.	Stafford Twp. Municipal	Toms River	3,200	Primary	0.5	0.2	35	600	400 No
50.	Brick Twp.-Brick Plaza Inc.	Tributary to Manahawkin Bay	7,000	Second.	0.5	0.3	85	1,400	200 Yes
51.	Brick Twp.-Milza Realty	Meteteconk R.	Na	Inter.	0.03	0.02	70	Na	Na Yes
52.	Brick Twp.-Riviera Corp.	Tributary to Meteteconk R.	Na	Second.	0.015	0.002	85	Na	Na Yes
53.	Jackson Twp. Bd. of Ed.	Kettle Cr.	500	Second.	0.03	0.01	85	150	20 Yes
54.	Ocean Twp. Mid Jersey Sewer Co.	Barnegat Bay	Na	Second.	0.02	0.01	85	Na	Na Yes
55.	Union Twp.-Indianola	M. Br. Toms R.	1,000	Inter.	0.1	0.02	70	Na	Na Yes
56.	Lakewood-Mary Knoll School	Barnegat Bay	500	Inter.	0.1	Na	70	Na	Na Yes
57.	Lakewood-St. Gabriels Jr. Col.	Barnegat Bay	2,000	Inter.	Na	Na	70	Na	Na No
58.	Dover S. A.-Holiday City	S. Br. Meteteconk	80	Inter.	0.01	0.01	70	20	Negligible Yes
59.	Dover S. A.-Bellcrest	T. to S. Br. Meteteconk	2,600	Second.	0.3	0.1	55	520	50 Yes
		Kettle Creek							
		Br.-Applegate Cove	400	Inter.	0.03	0.07	50	80	40 Yes
		to Barnegat Bay							
ATLANTIC COUNTY (See Figure 2)									
I. Systems Discharging Directly to Atlantic Ocean									
None									
II. Systems Discharging Directly to Shellfishing Waters									
60.	Atlantic City (City Island Plant)	Beach Thoro.	250,000	Primary	15.0	16.0	35	50,000	32,000 Yes
61.	Atlantic City (Texas Avenue Plant)	Beach Thoro.	12,000	Screening + Cl ₂	Unk.	0.8	10	2,400	2,200 Yes
62.	Pleasantville	Lakes Bay	25,000	Second.	2.0	1.3	85	5,000	500 Yes
63.	Ventnor-Margate	Beach Thoro.	55,000	Primary	3.5	5.0	20	11,000	8,800 Yes
64.	Longport (75th St.)	Beach Thoro.	6,500	Primary	0.5	0.6	30	1,300	900 Yes
65.	Coronado Point	Patcong Creek	7,000	Second.	1.0	0.5	85	1,400	200 Yes
66.	Longport 1st St.	Risley Channel	Na	Primary	0.04	Na	35	Na	Na No

TABLE 3

MUNICIPAL AND INSTITUTIONAL WASTE DISCHARGES
NEW JERSEY COASTAL BASIN
(SHARK RIVER TO CAPE MAY) (Cont'd)

Ident. No.	Municipality by County and Major Discharge Water	Receiving Waters	Est. Pop (Summer)	Degree of Treatment	FLOW-MGD		ESTIMATED BOD LOADINGS a/			Orders Issued
					Design	Actual	Influent	Percent Removal	Effluent	
CAPE MAY COUNTY (Cont'd)										
83.	Ocean City - 4 th Ave. Plant	Gr. Egg H.	25,000	Second.	1.0	0.5	5,000	85	800	Yes
84.	Sea Isle City	Ludlams Thoro.	3,500	Primary	0.3	0.3	700	30	500	Yes
85.	Avalon Sew. Auth.	Great Sound	10,000	Inter.	1.0	0.8	2,000	70	600	Yes
86.	Stone Harbor Boro.	Great Channel	10,000	Primary	1.2	0.9	2,000	35	1,300	Yes
87.	North Wildwood City	Hereford Inlet	30,000	Primary	2.0	1.5	7,000	35	4,600	Yes
88.	Wildwood City	Post Cr.	30,000	Primary	4.0	5.0	10,000	30	7,000	Yes
89.	Wildwood Crest	Grassy Sound	17,000	Primary	1.9	1.5	3,400	30	2,400	Yes
90.	Dennis Twp. N.J. Highway Auth.	Ludlams Bay	2,000	Second.	0.03	0.02	400	85	60	Yes
91.	Cape May C. H.	Hereford Inlet	4,600	Primary	0.1	Na	900	30	600	Yes
92.	Middle Twp. S. A. Garden Lake-Middle Twp.	Grassy Sound	Na	Inter.	0.02	Na	Na	70	Na	Yes
93.	Lower Twp. Bay Auth.	Cape May H.	Na	Second.	0.03	0.02	400	85	60	Yes
III. Systems Discharging Indirectly to Shellfishing Waters										
94.	Lower Twp.-Bd. of Ed. Lower Mainland Reg. H.S.	Mill Creek to Cape May H.	Na	Second.	0.02	Na	Na	85	Na	Yes

CAMDEN COUNTY (See Figure 2)

I. Systems Discharging Directly to the Atlantic Ocean

None

II. Systems Discharging Directly to Shellfishing Waters

None

III. Systems Discharging Indirectly to Shellfishing Waters

95.	Berlin Boro Man.	Tributary to Gr. Egg H. R.	3,000	Inter.	0.7	0.3		720 d/	85	110 d/	Yes
96.	Winslow Twp. State Hosp. & Ancora	Tributary to Mullica R.	2,500	Second.	1.2	0.2		500	85	80	No

BURLINGTON COUNTY (See Figure 2)

I. Systems Discharging Directly to the Atlantic Ocean

None

TABLE 3
MUNICIPAL AND INSTITUTIONAL WASTE DISCHARGES
NEW JERSEY COASTAL BASIN
(SHARK RIVER TO CAPE MAY) (Cont'd)

Ident. No.	Municipality by County and Major Discharge Water	Receiving Waters	Est. Pop. (Summer)	Degree of Treatment	FLOW-MGD		ESTIMATED BOD LOADINGS ^{a/}			Orders Issued
					Design	Actual	Influent	Percent Removal	Effluent	
BURLINGTON COUNTY (Cont'd)										
II. <u>Systems Discharging Directly to Shellfishing Waters</u>										
None										
III. <u>Systems Discharging Indirectly to Shellfishing Waters</u>										
97.	Washington Twp. Leeks	Mullica R.	Na	Inter.	0.01	Na	Na	70	Na	Yes
GLOUCESTER COUNTY (See Figure 2)										
I. <u>Systems Discharging Directly to Atlantic Ocean</u>										
None										
II. <u>Systems Discharging Directly to Shellfishing Waters</u>										
None										
III. <u>Systems Discharging Indirectly to Shellfishing Waters</u>										
98.	Monroe Mun. Util. Auth. (Williamstown)	Tributary to Gr. Egg H. R.	4,600	Second.	0.4	0.3	900	85	100	No

a/ Where plant data were not available waste loads were estimated using 5-day 20° Centigrade biochemical oxygen demand (BOD) in pounds per day, based upon summer population, a factor of 0.2 pounds of BOD per capita, and a percentage of BOD removal for each sewage treatment plant. Waste facilities were credited with 35 percent BOD removal for primary treatment, 70 percent for intermediate treatment and 85 percent for secondary treatment. The percentage of BOD removal was adjusted for those cases where plants were found to be overloaded. For purposes of this study, type of treatment provided is defined as: primary, primary settling; intermediate, any treatment in excess of primary settling but less than full scale biological secondary treatment; and secondary treatment, primary settling, biological treatment and secondary settling.

b/ Formal pollution abatement orders issued by the New Jersey State Department of Health.

c/ Plant has secondary treatment facilities - due to low flows, only primary units are in use.

d/ Treatment plant data.

e/ Includes some industrial waste.

f/ Day school - flow figure represents school period.

Na Information not available.



FIGURE 1

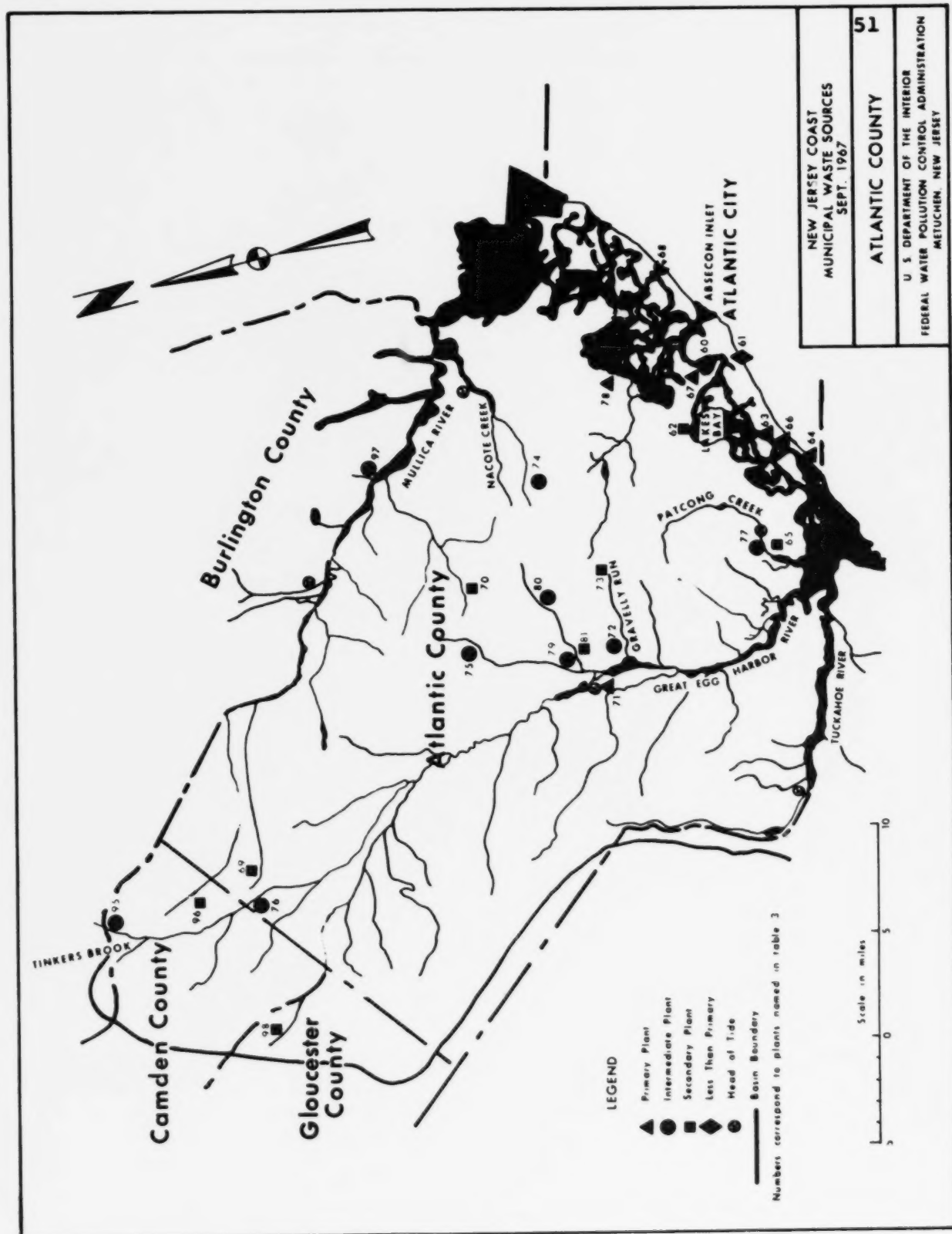


FIGURE 2

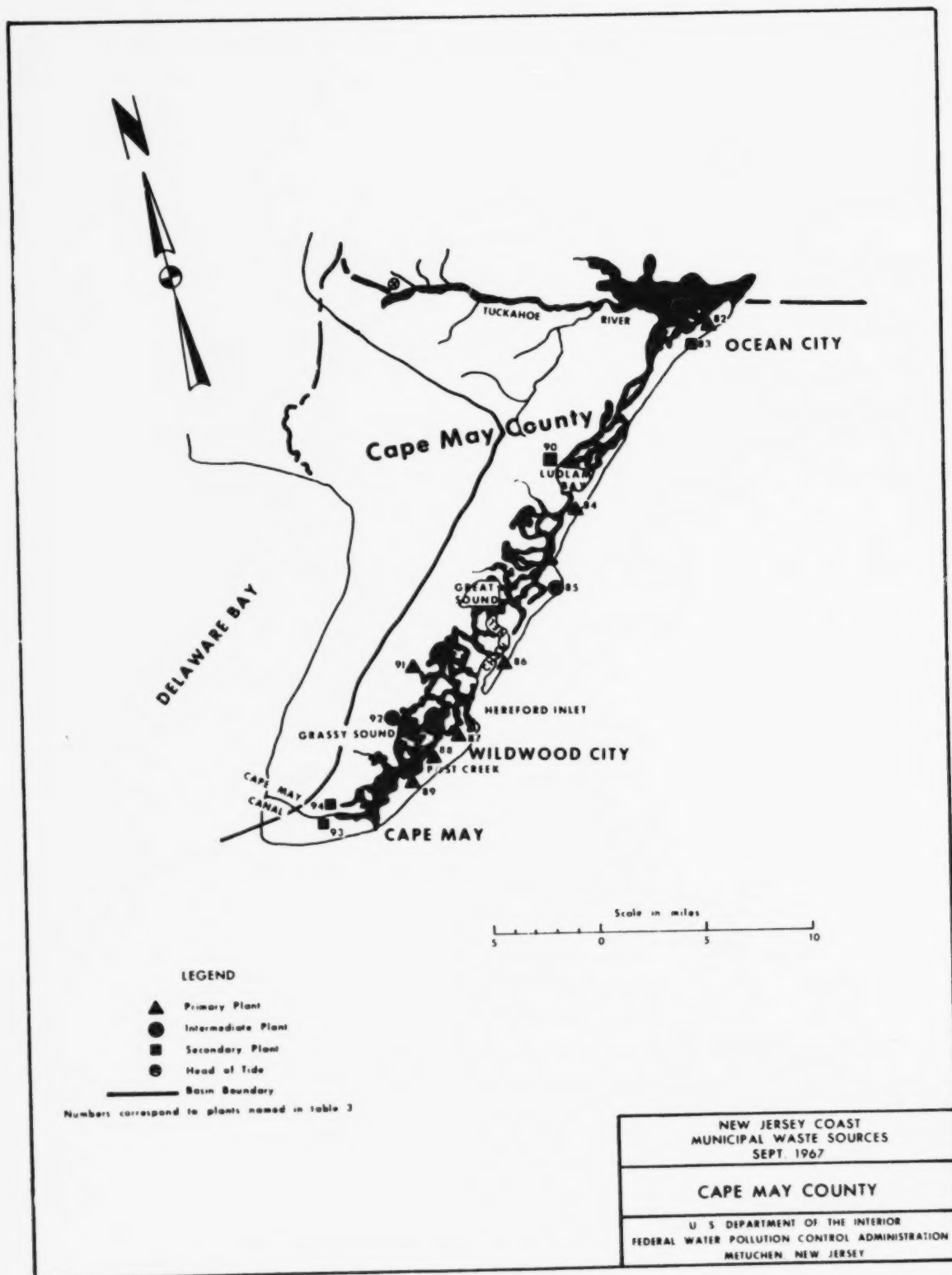


FIGURE 3

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Nearly three-quarters of the waste load to the estuarine shellfish waters is concentrated in the Atlantic City and Wildwood-Cape May areas. Both these areas contain a large concentration of recreational facilities. Near Atlantic City four plants operate near or beyond design capacity. In the Wildwood-Cape May area, three municipal primary sewage treatment plants which discharge about 8 mgd directly into the intracoastal waterway are either outdated or overloaded.

The 17 municipal plants which discharge directly into the Atlantic Ocean utilize outfall pipes extending from 1,000 to 1,200 feet offshore. For the most part, the effluent from plants discharging municipal waste directly into the ocean is chlorinated only from May to October each year.

Industrial Wastes

At present, industrial waste is not a major pollution problem in the New Jersey Coastal Basin. The economy of the region is primarily recreational and agricultural, with only light industrial activity. The major industrial plant is the Toms River Chemical Corporation, Toms River, which employs about 1,200 persons, and produces dyes, resins and plastics. Treatment is provided the combined industrial waste and sanitary sewage, and the effluent

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discharged through a 3,500-foot-long outfall into the Atlantic Ocean.

Wastes from three firms: Nescafe Coffee, Freehold; Glidden Co., Jackson Township; and New Jersey Menhaden Products, Wildwood, appear to cause occasional local pollution problems. Thirteen industrial plants discharge wastes to municipal sewage treatment facilities, and the remaining ten industries in the basin either utilize dry processes or provide subsurface waste disposal.

Cesspools and Septic Tanks

Based upon Bureau of Census data for 1960, within the Atlantic Coastal watershed of New Jersey there are more than 300,000 persons in 100,000 homes who dispose of domestic sanitary waste waters by individual cesspools or septic tanks. Leaching of pollutants, in particular nutrients, from cesspools and septic tanks may constitute a significant source of pollution of these waters.

Recreational Boating

Recreational boating can represent a significant source of pollution, particularly from the standpoint of pathogenic bacteria. Over 300,000 boats are registered within a few hours drive of the area, indicating that wastes

from this source may be highly significant. The State of New Jersey does not at present have any regulations governing the discharge of human waste from boats in tidal waters.

The development of marinas and associated facilities (presently 110 launch ramps and 18,000 marina berths) to meet present and future recreational boating needs will result in greater pollution unless closer regulatory and surveillance activity is provided.

Other Sources of Pollution

Water quality may be adversely affected by a variety of other land and water uses. Agricultural activities within the area result in agricultural chemicals spread over the land surface being washed into surface waters or percolated into the ground water aquifers. This transport of nutrient fertilizers and toxic herbicides and pesticides, across and through the land into adjacent bodies of water, should be recognized as a possible contributing factor to the problems in these waters.

The disturbance of bottom muds by dredging operations can result in a re-suspension of accumulated organic sludges and silt. In addition, uncontrolled dredging may result in the formulation of significant potholes in the bottom of bays, thereby increasing the detention time and

reducing the circulation, the result being inadequate mixing of pollutants with the receiving water and inadequate flushing of the system.

V. EFFECTS OF WASTE ON WATER QUALITY AND USES

One of the problems of waste contamination of the water of the bays and inlets in the New Jersey Coastal Area can be illustrated by a statement issued by the President's Science Advisory Committee on Barnegat Bay, an area typical of the New Jersey coast. This report states in part:

"1. Barnegat Bay, N. J.: Sewage - Proliferation of a sudden Red-Tide in Barnegat Bay during August, 1964 generated considerable controversy which centered on the role of a small chemical company whose effluents enter the Bay via a tidal estuary. Barnegat Bay..... is shallow, highly productive, and its northern shores are densely populated with many miles of small summer cottages in rows of 10-20 perpendicular to the Bay.

"...Most Bay residents assumed that the bloom water discoloration and fish kill were due to the chemical company's dye effluent, although actually the bloom species does not utilize this kind of molecule. Organic nitrate and phosphate sources and bacteria... which most probably caused their massive proliferation

"are the result of sewage and septic tanks wastes-- wastes from cottages of persons who populated Barnegat's shores to enjoy their recreational resources...

"...Thus, knowledge of the nutritional requirements of the bloom species gives circumstantial evidence that the source of pollution which supported the red tide was primarily sewage that has leached into the Bay. A repetition of this occurrence in coming summers will undoubtedly damage the shore resort economy of several towns along Barnegat's banks." 17/

Bacteria

Bacteria from human wastes constitute a major water pollution problem in the basin. These bacteria originate from the discharge of inadequately treated municipal wastes, from the discharges of septic tanks and cess-pools on or near the shore, and from recreational boats using these waters.

The chain of disease transmission by pathogenic bacteria from human waste, through shellfish which are eaten raw or improperly cooked, has been well established. The National Shellfish Sanitation Program was established to control such disease transmission. This program is an excellent teaming of State, Federal and industry resources

aimed at preserving and managing the shellfish industry. The National Program, of which New Jersey is a member, has set guidelines for the determination of proper sanitary quality and classification for the designation of waters approved for shellfish harvesting. Approval or condemnation of a shellfish area is based on the following factors: 18/

1. Amount of dilution water available;
2. Hydrographic conditions;
3. Survey of actual and potential sources of pollution, including fecal material, radionuclides, and chemical wastes;
4. Possible fresh pollution sources, such as that from toilet discharges from boats directly over shellfish beds;
5. Lack of knowledge of above factors pending a sanitary survey; and
6. Bacteriological data, with samples collected under the worst hydrographic conditions.

In accordance with this program the New Jersey State Department of Health has closed valuable shellfish harvest areas throughout the area. The shellfish areas which have been closed are shown in Figure 4 and listed in Table 4. A copy of the closure orders is included in Appendix I. The harvest of shellfish is prohibited year-round in more

than 33,000 of the 126,000 acres of water within the study area.

The compilation of actual and potential harvest of hard and soft clams in the coastal areas indicates that a minimum of 2-1/2 bushels per acre could be harvested in the acreage (33,000) closed year-round to shellfishing if existing and suspected pollution sources were abated and the harvest (catch) is left to purely natural propagation. Based on the 1966 dockside price of \$5.04 per bushel for the study area, the potential natural harvest from the closed areas would have an annual value of roughly \$400,000.

Clammers could double the natural harvest to five bushels per acre by carrying out only the simplest of controlled fish farm practices. Accordingly, output could double yielding clammers in the Jersey Coastal Area, a harvest valued at \$800,000 per year. Marine biologists engaged in the study of mollusk reproduction have shown that an annual harvest of 50 bushels per acre can be obtained using scientific mollusk farm practices. 19/

A recent study of the Florida shellfish industry and the price structure of the shellfish industry indicated that the final retail value of shellfish products is roughly four times the dockside value.²⁰ The economic loss due to the closure of shellfish harvest areas may be summarized as

follows:

Harvest Method	Output/acre <u>Bushels</u>	<u>Annual Loss</u>	
		Dockside <u>Value</u>	Retail <u>Value</u>
Present (natural)	2-1/2	\$400,000	\$1,600,000
Using Simple Farm Practices	5	\$800,000	\$3,200,000

The economic loss in shellfish production is not the sole damage caused by the discharge of bacteria to the study waters. The discharge of inadequately treated human wastes creates a hazard to the health of those coming in contact with the receiving waters.

Dissolved Oxygen

Dissolved oxygen is one of the most significant parameters of water quality. When an organic load, such as that measured by the BOD test, is imposed upon a water, dissolved oxygen is utilized in the stabilization process. Oxygen is transferred and dissolved from the atmosphere, or from photosynthetic production by aquatic plants. Adequate levels of dissolved oxygen are necessary to support fish and other aquatic life. When total depletion of oxygen occurs, the waters become septic and further decomposition produces

TABLE 4
ACTIVE SHELLFISH AREAS
CLOSED TO HARVESTING OF SHELLFISH*

Areas Closed Full Year

<u>AREA</u>	<u>ACREAGE</u>
Shark River	810
Manasquan River	1,350
Barnegat Bay (Part) & Metedeconk River	2,010
Barnegat Bay (Part - Kettle Creek to Mathis Bridge)	2,490
Toms River	1,920
Barnegat Bay (Part - Mathis Bridge to Forked River)	1,180
Barnegat Bay (Part - Forked River to Main Point)	1,800
Manahawkin Bay (Main Point to Long Point)	1,340
Little Egg Harbor (Long Point to Beach Haven Inlet)	140
Mullica River	220
Great Bay	150
Brigantine Area (Great Bay to Absecon Inlet)	700
Reed Bay & Absecon Bay	3,570
Lakes Bay Area	3,960
Scull Bay	1,050
Great Egg Harbor River	1,160
Great Egg Harbor Bay	2,190
Peck Bay to Corson Inlet	350
Ludlam Bay	160
Sea Isle City Blvd. to Great Sound	640
Great Sound to Jenkins Sound	1,300
Hereford Inlet to Wildwood Blvd.	2,440
Wildwood Blvd. to Cape May	2,000
Total, Full Year Closure	32,930

Seasonal Closures

Manahawkin Bay (Main Point to Long Point)	170
Little Egg Harbor (Long Point to Beach Haven Inlet)	140
Scull Bay	80
Great Egg Harbor River	430
Great Egg Harbor Bay	420
Peck Bay to Corson Inlet	640
Great Sound to Jenkins Sound	170
Total, Seasonal Closure	2,050

* Data from the Water Supply and Sea Resource Program, Region 2, Public Health Service, U. S. Department of Health, Education, and Welfare (1967).

hydrogen sulfide gas, creating obnoxious environmental conditions.

The shellfish waters in the study area receive directly an estimated 81,000 lbs. per day of BOD from municipal wastes. As a result of the discharge of this waste into waters with limited dilution or restricted circulation, such as found in the various bays and lagoons of the study area, dissolved oxygen may be depressed to less than desirable values. The FWPCA sampling program conducted during the summers of 1966-67 showed that 20 percent of the samples taken in the waters from Absecon Inlet to Great Egg Harbor Inlet (restricted intracoastal waters) contained dissolved oxygen levels equal to or less than four milligrams per liter (mg/l.)

Nutrients

Human and animal feces contain phosphorus and nitrogen that serve as nutrients, or fertilizer, for both land and water plant life. Although other elements are necessary as nutrients for plant growth, deficiencies in phosphorus and nitrogen are believed to be the most common restraining factors on aquatic plant growth. Municipal waste is a significant source of phosphorus and nitrogen in these waters. Other sources may include the direct discharge from

recreational boats, runoff from adjoining agricultural areas, and percolation from cesspools and septic tanks.

New Jersey Coastal waters are rich in both phosphorus and nitrogen which support prolific growths of both suspended and attached algae. Open coastal waters commonly contain 0.02 to 0.05 mg/l of phosphorus (as P). Study area waters have been found to contain as much as 0.5 mg/l of phosphorus.

Although minimum concentrations of nitrogen required for algae blooms have not been determined for sea water, the generally accepted value for fresh water is 0.3 mg/l (asN). Results of the FWPCA sampling program (summer 1967) showed that of 160 stations sampled, 152 contained total available nitrogen (N) concentrations greater than 0.3 mg/l.

With the adequate supply of nitrogen and phosphorus, the waters of the study area support luxurious growths of suspended algae, attached filamentous algae and rooted aquatic plants. The suspended algae generally reduce aesthetic enjoyment of the waters by reducing their clarity, sometimes to the extent that objects in more than two feet of water are not visible from the surface. With changes in environmental conditions, the sudden death and subsequent decomposition of a dense algae population can deplete

dissolved oxygen to the extent that fish and other aquatic life are not able to survive.

These plants become detached from their moorings, especially during periods of turbulent water, accumulate as slimy masses in the surf and wash up on the shore. It is not uncommon to see masses of detached plants covering long reaches of the shore several inches deep and many feet from the water's edge. They not only present an unsightly appearance but also decay and produce extremely offensive odors. Such shoreline conditions prevent full development of the recreational potential of the area.

Suspended Solids

Suspended solids in sewage include large proportions of the decomposable organic solids. Within this area, the major source of such suspended solids is the discharge of inadequately treated municipal waste. Adequate treatment facilities are capable of removing 70 to 95 percent of such material from municipal wastewaters. Upon discharge to the receiving waters, the suspended solids immediately impart a grey turbidity to the waters and diminish their esthetic appeal. The heavier solids settle to the stream bottom in the vicinity of the points of discharge and form objectionable and harmful sludge deposits. These sludge blankets cover and destroy

the bottom aquatic life that serve as food for fish. A survey of the study waters by the Federal Water Pollution Control Administration in 1966 found sludge deposits at 34 sampling stations along the Intracoastal Waterway and its adjoining bays and tributaries. These deposits, in the form of strips of black odorous ooze, were found on the bottom as well as along the shore line, in some cases covered by shallow layers of sand that have been washed over them by wave action.

The organic material in the sludge undergoes a decomposition process which lowers the dissolved oxygen level in the overlying waters, at times to below that needed for fish and other aquatic life to survive. When complete depletion of oxygen occurs, the further decomposition of organic matter produces obnoxious hydrogen sulfide gas which appears as bubbles on the surface. This gas breaks loose masses of the deposited sludge and lifts them to the surface where they appear as unsightly grey or black odorous clumps and rafts.

The lighter suspended solids are carried downstream by the velocity of the following water to settle and form similar sludge banks in eddy areas distant from the points of discharge. In coastal areas, the salt content of the sea water precipitates the fine colloidal portions

of the suspended solids to form additional sludge deposits where fresh and salt waters meet.

Thus, these suspended solids may produce harmful effects throughout the entire length of the receiving streams from the points of discharge to their mouths.

VI. STATUS OF POLLUTION CONTROL PROGRAMS

Water Quality Standards

The Water Quality Act of 1965 amended the Federal Water Pollution Control Act to provide for establishment of water quality standards for interstate waters. It is the position and purpose of the Federal Water Pollution Control Administration to encourage and support the States in establishing their own standards. Standards adopted by a State may be accepted by the Secretary of the Interior if he determines that the State criteria and plan are consistent with the purposes of the Act, i.e., "...to enhance the quality and value of our water resources and to establish a national policy for the prevention, control, and abatement of water pollution." In the absence of State action, such standards will be adopted by the Secretary of the Interior under procedures set forth in the Act.

In 1964, the New Jersey State Department of Health

established a program of stream classification. The Department adopted water quality criteria for various uses of water and after public hearings issues formal rules and regulations classifying the waters and establishing minimum waste treatment requirements. Following a series of public hearings the State adopted in May 1967 standards for the waters of the Atlantic Coastal Basin and subsequently submitted these standards to the Secretary of the Interior under the Water Quality Act of 1965. Appendix II presents the classifications for these waters as submitted to the Secretary, rules and regulations for treatment requirements for all wastes discharged to these waters, and a copy of a typical pollution abatement order issued by the Department to achieve compliance with these standards. Similar orders were issued to a number of municipalities and institutions, as shown in Table 3.

State Abatement Programs

There has been increasing emphasis on water pollution control by the State of New Jersey, and a number of new programs initiated. To carry out the State's water quality management programs the Commissioner of the New Jersey State Department of Health in 1967 created the Division of Clean Air and Water.

The State Public Sanitary Sewerage Facilities Act

of 1965 authorizes the Commissioner of Health to make grants and loans to local governmental units for the preparation of feasibility studies on the engineering design of public sanitary sewerage facilities. The law declares that it is the public policy of the State, "to encourage and support, as hereinafter provided, the promotion, planning, development and construction of public sanitary sewerage facilities, including collection, transmission, treatment and disposal works on a regional or multi-unit basis."

Grants are authorized for the purpose of preparing feasibility studies and reports on projects for the collection, treatment and disposal of sewage involving two or more local governmental units, acting together on a joint basis. Loans are authorized for the preparation of preliminary engineering plans, detail design, engineering drawings and specifications, and contract documents for the construction of a new, or expansion of an existing, sewerage facility provided a feasibility study or a report upon the facility has been filed with and approved by the Commissioner. This Act became effective July 1, 1965, with \$1,000,000 appropriated for carrying out the grant and loan provisions. Additional funds have been appropriated for subsequent years.

The County Sewerage Financing Law (Chapter 205) passed in 1966, permits counties, separately or jointly

with municipalities located within the county: (1) to construct or acquire sewage disposal facilities or sanitary sewers, (2) to operate such facilities, and (3) to furnish the services of these facilities to any municipality within the county. The law also authorizes a county (1) to issue general obligation bonds to finance the construction or acquisition of such facilities, (2) to fix and collect fees for the facilities and services furnished, (3) to accept grants and gifts, and (4) to enter into contracts and carry out other business necessary to the operation of these facilities. This law is designed to supplement the "Sewerage Authorities Law." It specifically restricts a county from establishing any sewage disposal system, however, that would be competitive with a county sewerage or municipal utilities authority previously established under existing legislation, without the consent of such existing authority.

In 1967, the State of New Jersey enacted additional pollution abatement legislation encouraging the broad and active participation of representative leaders of industry, labor, government and selected professional societies in the clean waters program of the State. It created a Clean Water Council, within the State Department of Health, to advise the Commissioner on matters relevant to the management of the State's water pollution control program, to conduct studies

and hearings pertinent to the program, and to make enlightened recommendations to the Commissioner. It authorized the Commissioner of Health (subject to the availability of funds) to make grants to any county or municipality, or any combination or agency thereof or any State or interstate agency to assist such governmental units in the construction of those water pollution control projects as qualify for Federal Aid. The State's contribution toward the construction of such projects shall not exceed 30 percent of the cost of that portion of said projects that shall qualify for Federal Assistance. Under the provision of the Federal Water Pollution Control Act, as amended, this grant program makes possible increased Federal construction grants participation. In addition, the legislature broadened the program of loans and grants for feasibility studies and engineering reports and established educational scholarship programs at the graduate and undergraduate level to help further the purposes of administering the State's clean waters program by attracting qualified students to those fields of engineering essential to the progress of pollution abatement and water resource development.

Federal Grants

In the Jersey Coastal Area to date the Federal

Water Pollution Control Administration has spent or allocated \$4.6 million of the area's total waste facilities construction cost of \$12.8 million. This amounts to a Federal participation ratio in the Jersey Coastal Area of one Federal dollar to every three State-and-local dollars and contrasts well with the national average of one Federal dollar to four State-and-local.

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APPENDIX I

SHELLFISH CLOSURE ORDERS

NEW JERSEY STATE DEPARTMENT OF HEALTH

RULES AND REGULATIONS

* * *

The State Department of Health of the State of New Jersey pursuant to the authority vested in it by Chapter 177, Laws of 1947 hereby establishes the following Rules and Regulations for the administration of Revised Statutes 24:2-1 and 24:14-2. All prior Rules and Regulations in these matters adopted on various dates by the Department of Health of the State of New Jersey are hereby rescinded.

NEW JERSEY STATE DEPARTMENT OF HEALTH

By:

/s/ Roscoe P. Kandle, M. D.

Roscoe P. Kandle, M. D.

State Commissioner of Health

Effective Date: January 1, 1967

Filed with the Secretary of State: December 15, 1966

* * *

The State Department of Health hereby condemns all oyster, clam and mussel growing areas or other places from which oysters, clams or other shellfish are or may be taken, at all times of the year except when otherwise noted, in:

1. General

- (a) all lagoons dredged for the purpose of providing access to property and/or the dockage of boats.
- (b) all marinas, boat yards, boat basins, harbors or other places where docking facilities are provided for boats.

2. Northern New Jersey Area

- (a) all the waters lying west and north of Raritan Bay including: Raritan River, Arthur Kill, Kill Van Kull, Newark Bay, Passaic River, Hackensack River, Upper Bay, Hudson River and tributaries of the above bodies of water.

3. Raritan Bay Area

- (a) all the waters of Raritan Bay and tributaries thereof.
- (b) all the waters of Lower Bay and tributaries thereof.
- (c) all the waters of Sandy Hook Bay lying west

and north of a straight line beginning at Conover Light at Leonardo, N. J. and bearing approximately 45°T to Sandy Hook Lighthouse and; all the waters of Sandy Hook Bay south of a straight line beginning at the flashing green light at the end of the first spur of the Naval Ammunition Pier at Leonardo, N.J. bearing approximately 133°T to the flashing light at the eastern end of the Atlantic Highlands breakwater, then bearing 094°T across the southeast tip of the island at the mouth of Spermaceti Cove and terminating on Sandy Hook peninsula.

4. Shrewsbury River Area

- (a) all of the Shrewsbury River and tributaries thereof (not including the Navesink River) lying south from the above described line in Sandy Hook Bay running from the Naval Ammunition Pier to Sandy Hook peninsula. At the confluence of the Navesink and Shrewsbury Rivers, the condemned waters shall be only on the east side of a line beginning at the most southerly tip of Lower Rocky Point and connecting the most easterly edge of the

marshy islands in the mouth of the Navesink River then terminating on the mainland of Rumson Neck on the south side of the most southerly entrance to the Navesink River.

5. Navesink River

- (a) all that portion of the Navesink River and tributaries west from a straight line beginning on shore at the pier at the Fairhaven Yacht Works bearing approximately 001°T to the mouth of the small creek on the opposite shore of the Navesink River.
- (b) all that portion of the Navesink River contained within a line beginning at the southern terminus of the Oceanic Bridge then running along the bridge to the main channel, then following the south side of the channel westward to flashing light #15, then bearing approximately 181°T to the point of land on the south bank of the Navesink River.
- (c) all that portion of the Navesink River and tributaries contained within a line beginning at the southern terminus of the Oceanic Bridge and bearing approximately 65°T to the northwest tip of the small island southeast of

flashing light #9 marking the Navesink River Channel, then bearing approximately 93°T to northernmost tip of Barley Point, then following the eastern shore of Barley Point to its southeastern point at the mouth of Black Point Creek, then bearing approximately 180°T and terminating on the mainland shore of Black Point Creek.

6. Shark River Area

- (a) all of Shark River and tributaries.

7. Sea Girt Area

- (a) all of Sea Girt Inlet.
- (b) all of Wreck Pond and tributaries.

8. Manasquan River Area

- (a) all of Manasquan River and tributaries including Stockton Lake, Watson Creek, Glimmer Glass, and Lake Louise.
- (b) all of Bay Head - Manasquan Canal.

9. Bay Head Area & Metedeconk River

- (a) all of Beaverdam Creek and tributaries and all of Metedeconk River west from a straight line beginning at Flashing Red light #10 off Perch Hole Point at the southern end of Bay Head - Manasquan Canal and bearing

approximately 226°T to Flashing Red light #2 south of Wardell Neck, then bearing approximately 172°T through Flashing Green light #1 and terminating on the south shore of the Metedeconk River.

10. Island Beach Area - Bay Head to Seaside Park

- (a) all that portion of Barnegat Bay and tributaries north and east of a line beginning at Flashing Red light #10 off Perch Hole Point at the southern end of Bay Head - Manasquan Canal, then running in a southerly direction to Flashing Red light #12, then to Flashing Red light #14, then to the northwest tip of Herring Island, continuing along the shore of Herring Island to its southernmost tip, then bearing approximately 185°T to inland waterway marker 23, then following the east side of the inland waterway channel to can buoy "27", then bearing approximately 202°T to the most westerly point of land in "Curtis Point", then bearing approximately 189°T to the most westerly point of land just south of "Mantaloking Shores", then bearing approximately 213°T to Flashing Red light #2 off

"Normandy Beach", then bearing approximately 169°T to the nearest island to the south, then along the shore of that island to its southeastern point, then bearing approximately 177°T to the east tip of the 2 islands off "Ocean Beach" continuing along the east shore of that island and the next island immediately to the south to its southernmost point, then bearing approximately 181°T to Flashing Green light #13 off Lavallette, then bearing approximately 234°T to Flashing Green light #11 off West Point Island, then bearing approximately 159°T to Flashing Red light #10 off West Point Island, then bearing approximately 187°T to the northernmost point of the marsh island to the south of that light, continuing along the shore of that island to its southernmost point, then bearing approximately 221°T to the westernmost tip of Pelican Island, then bearing approximately 130°T to Flashing Green light #3 off Seaside Heights, then bearing approximately 170°T to the southwest corner of the bulkhead west of Berkeley Yacht Basin, then bearing approximately 176°T to

the western end of the municipal pier off 5th Ave. in Seaside Park, then bearing approximately 210°T to the western end of the municipal pier off 14th Ave. in Seaside Park, then bearing approximately 186°T to the next point of land, then bearing approximately 178°T and terminating at the next point of land at Island Beach State Park.

11. Dover Township Area from Kettle Creek to Toms River

- (a) all of Kettle Creek and tributaries north and west from a straight line beginning at Seaweed Point and bearing approximately 241°T to Andrew Point at Green Island.
- (b) all of Silver Bay and tributaries west from a straight line beginning at Andrew Point at Green Island and bearing approximately 206°T to the next point of land (Cattus Island).
- (c) all of the Applegates Cove and tributaries west of a straight line beginning at Tilton Point and bearing approximately 333°T to next point of land.
- (d) all of Shelter Cove west from a straight line connecting the points of land at its mouth.

- (e) all of Goose Creek and tributaries west from a straight line beginning at the southern point at the mouth of Shelter Cove and bearing approximately 195°T to the next point of land.

12. Toms River Area

- (a) all of Toms River and tributaries west from a straight line beginning at Goodluck Point and bearing approximately 353°T to the most easterly point of land at "Windsor Park", north of the Mathis Bridge.

13. Berkeley Township Area - Toms River to Cedar Creek

- (a) all of the waters west from a line beginning at the northern tip of Berkeley Island, on the north side of Cedar Creek, and bearing approximately 294°T to the next point of land, closing off the first cove north of Berkeley Island, then bearing approximately 318°T to the next point of land, closing of the next cove to the north, then bearing approximately 351°T to the point of land on the north bank of Maple Creek, then bearing approximately 021°T to the most easterly of the small islands off the mouth of Clamming Creek, then

bearing approximately 011°T to the most easterly point of land on the south bank of Potter Creek (Dicks Landing), then bearing 038°T to Flashing Red light #60 north of "Berkeley Shores", then bearing approximately 045°T to the eastern end of Barnegat Pier, then continuing in a generally northerly direction along the offshore ends of the piers and terminating on the north bank at the entrance to Goodluck Harbor Marina.

Cedar Creek (Lanoka Harbor Area)

- (a) all of Cedar Creek and tributaries west from a straight line beginning at the southeasterly tip of Berkeley Island on the north side of the mouth of Cedar Creek and bearing approximately 185°T to the next point of land east of Flashing light #1 on the south shore of Cedar Creek.

14. Forked River Area to Barnegat (Double Creek) Area

- (a) all those waters west from a line beginning at Flashing Red light #4 off the mouth of Forked River and bearing approximately 347°T to a point of land north of Forked River; also beginning at the same light the line bears

approximately 219°T through Flashing light #3 marking the entrance channel at Oyster Creek to the entrance channel at Holiday Harbor, then bearing approximately 187°T to the entrance channel at Waretown Creek, then bearing approximately 196°T to the entrance channel at Liberty Harbor, then bearing approximately 187°T to the entrance channel to Barnegat Beach, then bearing approximately 190°T to Flashing Red light #2 at the entrance to Double Creek, then bearing approximately 186°T to the point of land across the entrance to Double Creek, then bearing approximately 224°T to the next point of land to the southwest and continuing in a straight line to its terminus on the mainland.

15. Long Beach Island Area, Barnegat Light to Holgate

- (a) all that portion of Barnegat Bay, south and east from a line beginning at Barnegat Lighthouse and running in a northwesterly direction to red nun buoy #4, then running in a southwesterly direction through Flashing light #1, then continuing in a straight line to its terminus on High Bar peninsula.

- (b) all that portion of Barnegat Bay and Manahawkin Bay lying east and south from a line beginning at the western end of Arnold Rd. in High Bar Harbor and bearing approximately 217°T to the northeast point of the southernmost of the two islands just off shore, then along the east shore of that island to its southeast point, then bearing approximately 140°T to the most easterly tip of Vol Sedge, then along the east shore of that island and across to the southernmost tip of the other island of Vol Sedge, then bearing approximately 170°T to a point on the west side of the staked channel directly off the mouth of the lagoon at "Long Beach Club Estates", then bearing approximately 236°T to the west side of the staked channel around the outer perimeter of "Loveladies Harbor", then following the west side of that channel around to the southwest side of "Loveladies Harbor" until it intersects a straight line connecting Flashing Red light #2 off Harvey Cedars Harbor with Barnegat Lighthouse, then bearing approximately 204°T

along that line to Flashing Red light #2, then bearing approximately 235°T toward Flashing Red marker #28 until it intersects a line connecting Barnegat Light and Woods Island, then along that line bearing 205°T to the westernmost tip of Woods Island which is adjacent to flashing light #85, then bearing approximately 112°T to the nearest point of land in Harvey Cedars, then bearing approximately 219°T to the next point of land, then bearing approximately 196°T to the point of land just north of Barbay Road in Long Beach Twp., then bearing approximately 209°T to the end of the pier at the end of Bay Shore St. in Long Beach Twp., then bearing approximately 229°T to the pier at the end of N. 9th St. in Surf City (Surf City Yacht Club), then bearing approximately 239°T to the point of land at the end of N. 3rd St. in Surf City, then bearing approximately 263°T to a point of land on Cedar Bonnet Island, then along the north shore of that island and across the entrance to the two cuts into the island and terminating on the northwest bank at the

entrance to Barnegat Isle Marina.

- (c) all that portion of Manahawkin Bay and Little Egg Harbor lying east and south from a line beginning at the southeast tip of Cedar Bonnet Island and bearing 181°T to Flashing Red light #8, then continuing to Flashing Green light #9, then continuing to Flashing Red light #34 marking the intracoastal waterway, then bearing approximately 198°T to the small island inshore from channel marker #36, then continuing to Flashing Red light #38, then following the west side of the intracoastal waterway to Flashing Red light #44, then in a straight line to Flashing Green light #47, then in a straight line to Flashing Green light #53, then continuing in a straight line to channel marker #54 and then following the west side of the intracoastal waterway to Flashing Red light #64, then bearing approximately 239°T to the southernmost tip of the small island off the Beach Haven Yacht Club, then bearing approximately 226°T to the northernmost tip of Mordecai Island, then along the shore of that island to its

southwest point, then bearing approximately 267°T to Flashing light #75, then bearing approximately 191°T to a point of land, then continuing along the shoreline to the southwest closing off the entrances to Tebco's Boat Basin and Silver Sands Marina, then from the bulkhead at the end of Inlet Drive, the line bears 215°T and terminates at the point of land on the south side of Holgate.

16. Beach Haven West - Mallard Island Area

- (a) all of Cedar Creek and Manahawkin Creek north and west from a line beginning on the northern bank at the entrance to Cedar Creek and bearing approximately 150°T to a small island, then bearing approximately 209°T to the western end of the most westerly island along the Manahawkin Causeway, then bearing approximately 173°T to the most easterly tip of Thorofare Island, then bearing 218°T toward the "Fish Factory" on Seven Islands in Great Bay for a distance of approximately 750 yards until it intersects a line beginning at Flashing Red light #28 marking the inland waterway and bearing approximately 275°T

toward Flashing light #1 off Cedar Run Cove. The condemned area boundary continues along said line bearing 275°T for a distance of approximately 1100 yards until it intersects a line beginning at the next point of land west from Popular Point and bearing approximately 214°T toward the above mentioned "Fish Factory". The condemned area boundary then continues along said line in a northeasterly direction and terminates at the point of land where the line begins.

17. Cedar Run Area (Seasonal)

- (a) all of Cedar Run and tributaries west from a straight line across the creek bearing 210°T from Flashing Red light #2 in Cedar Run.
- (b) all of Cedar Run Cove lying between the above described line and a straight line beginning at Horse Point and bearing approximately 037°T to a point of land on the opposite side of the cove shall be condemned from May 1 through October 31 of each year and approved for the harvest of shellfish from November 1 through April 30 of each year.

18. Westcunk Creek

- (a) all of Westcunk Creek and tributaries west from a straight line across the creek beginning at Flashing light #1 at the mouth of Westcunk Creek and bearing approximately 006°T to the southern point at the mouth of Dinner Point Creek.

19. Tuckerton Area (Seasonal)

- (a) all of Tuckerton Creek and tributaries north and west from a straight line beginning at Flashing light #17 at the mouth of Tuckerton Creek and bearing approximately 073°T to a point across Tuckerton Cove.
- (b) all of Tuckerton Cove lying between the above described line and a straight line connecting Thorofare Point and Gaunt Point shall be condemned from May 1 through October 31 of each year and approved for the harvest of shellfish from November 1 through April 30 of each year.

20. Atlantis and Mystic Isles Area

- (a) all of Big Thorofare and tributaries.
- (b) all of Big Creek and tributaries.

21. Mullica River - Great Bay Area

K. Walker

- (a) all of Bass River and tributaries.
- (b) all of Nacote Creek and tributaries.
- (c) all of Mott Creek upstream from a straight line beginning at Flashing Red light #2 at the mouth of Mott Creek, and bearing approximately 226°T to the opposite shore of the creek.
- (d) all of Oyster Creek and tributaries.

22. Reed Bay Area

- (a) all the waters north and west of a line beginning at the most southerly point of land on the west side of Somers Cove and bearing approximately 215°T terminating on the mainland southwest from the mouth of Conover Creek.
- (b) all of Conover Creek and tributaries.

23. Brigantine Area

- (a) all of Golden Hammock Thorofare.
- (b) all of Bonita Tideway but not the creeks between Bonita Tideway and Eagle Bay.
- (c) all of Baremore Quarters.
- (d) Wading Thorofare from Bonita Tideway and Baremore Quarters northwest to a line beginning at Flashing Red light #5 and bearing approximately 196°T terminating on the opposite shore of Wading Thorofare and another line beginning at Flashing red light #6 bearing approximately 041°T terminating on the opposite shore of Obes Thorofare.

- (e) all of Black Hole.
- (f) all of Low Water Thorofare.

24. Atlantic City - Absecon Area

- (a) all of Absecon Inlet.
- (b) all of Absecon Channel south and west from a line across Middle Thorofare beginning at Debs Point and bearing approximately 056°T through Inland Waterway Channel marker #73 terminating on the opposite shore; and south and west from a line across the southeast entrance to Wills Thorofare including; Mankiller Bay and Point Bar Thorofare.
- (c) all of Absecon Bay south and west from a line beginning at the southwest bank of the northwest entrance to Wills Thorofare bearing approximately 305°T and terminating on the mainland east of Absecon Creek.
- (d) all of Absecon Creek.
- (e) all of Jonathan Thorofare.
- (f) all of Newfound Thorofare.
- (g) all of Duck Thorofare.
- (h) all of Clam Thorofare and the canals in the Venice Park section of Atlantic City.
- (i) all of Clam Creek and contiguous harbors.

- (j) all of Beach Thorofare from Absecon Channel to Great Egg Harbor Inlet.
- (k) all of Inside Thorofare and West Canal.
- (l) all of Great Thorofare.

25. Pleasantville - Northfield - Linwood - Margate Area

- (a) all of Lakes Bay.
- (b) all of Shelter Island Bay.
- (c) all of Lakes Channel.
- (d) all of Dock Thorofare and tributaries.
- (e) all of Stillman Creek.
- (f) all of Mulberry Thorofare and tributaries.
- (g) all of Risley Channel.
- (h) all of Shelter Island Waters.
- (i) all of Whirlpool Channel.
- (j) all of Scull Bay.
- (k) all of Sod Thorofare and tributaries.
- (l) all of Broad Thorofare and tributaries.
- (m) all of Hospitality Creek.
- (n) all of Beach Thorofare as specified in Atlantic City Absecon Area.

26. Ocean City - Somers Point Area (Seasonal)

- (a) all of Great Egg Harbor Inlet.
- (b) Rainbow Channel northeast from the Ocean City-Somers Point Bridge.

- (c) all of Rainbow Thorofare northeast from the Ocean City-Somers Point Bridge.
- (d) all of Elbow Thorofare and Ship Channel north and east from the Ocean City-Somers Point Bridge within a line beginning at Anchorage Point and bearing approximately 210°T to the southeasterly end of an unnamed island, then along that island to its opposite end, then bearing approximately 190°T to the largest of the Rainbow Islands, then along the shore of that island to the Ocean City-Somers Point Bridge, then along the bridge to Somers Point, then along the shore of Ship Channel, across the entrance to Bass Harbor and continuing to its starting point at Anchorage Point shall be condemned for the harvest of shellfish from May 1, through October 31 of each year and approved for the harvest of shellfish from November 1, through April 30 of each year.
- (e) all of Bass Harbor from Ship Channel to a line beginning on the southeast bank at the mouth of a ditch opposite the southeast side of an island at the entrance of Steelman Bay and

bearing approximately 300°T terminating on the opposite side of Bass Harbor.

- (f) all of Steelman Bay and the tributary on the northwesterly side of the bay north and east from the line specified in section (e) above, shall be condemned for the harvest of shellfish from May 1, through October 31 of each year and shall be approved for the harvest of shellfish from November 1, through April 30 of each year.
- (g) all of Patcong Creek and tributaries upstream from a line beginning at Channel Marker Fl "1" bearing approximately 110°T and terminating on the opposite side of Patcong Creek.
- (h) all of Beach Thorofare from Great Egg Harbor Inlet to a line beginning at the southwest point of Shooting Island bearing approximately 169°T and terminating on the opposite side of Beach Thorofare, including the waters south and east from a line beginning at Inland Waterway Marker Fl R "12" bearing 040°T passing through Channel Marker Fl R "6" and terminating on the island northeasterly from Fl R "6".

- (i) all of Peck Bay contained within a line beginning on the northerly point at the mouth of the unnamed ditch at Golders Point and bearing approximately 125°T to Shooting Island, then along the shore of Shooting Islands to and along the line described in section (h) as bearing 169°T from the southwest point of Shooting Island, then along the east shore of Peck Bay to and along a straight line transecting Peck Bay passing through Inland Waterway Marker "29" bearing approximately 306°T, then in a northerly direction along the west shore of Peck Bay to its beginning at Golders Point shall be condemned for the harvest of shellfish from May 1, through October 31 of each year and shall be approved for the harvest of shellfish from November 1, through April 30 of each year.
- (j) all of Peck Bay south and west from the line transecting Peck Bay through Channel Marker "29" bearing 306°T described in section (i) above.
- (k) all of Crook Horn Creek from Peck Bay to Middle Thorofare.

- (l) all of Upland Thorofare and tributaries.
- (m) all of Beach Creek.

27. Great Egg Harbor River (Seasonal)

- (a) all the waters of Great Egg Harbor River and tributaries between a straight line beginning at Channel Marker Fl G "5" bearing approximately 93°T and terminating on the opposite shore of Great Egg Harbor River and a line beginning at the point of land on the west bank at the mouth of English Creek and bearing approximately 149°T to the point of land on the opposite side of Great Egg Harbor River shall be condemned for the harvest of shellfish from May 1, through October 31 of each year and shall be approved for the harvest of shellfish from November 1, through April 30 of each year.
- (b) all of Great Egg Harbor River and tributaries upstream from the line at English Creek described in section (a) above.

28. Tuckahoe River

- (a) all the waters of Tuckahoe River and tributaries upstream from a straight line beginning on the east bank at the mouth of

Job Creek bearing approximately 23°T to the island off shore along the shore of the island and terminating on the opposite bank of the Tuckahoe River.

29. Sea Isle City Area

- (a) all of Maple Swamp (both branches) including the cove at the mouth.
- (b) all of Big Elder Creek.
- (c) all of Little Elder Creek.
- (d) the waters of Ludlam Bay south and west from a line beginning on the northwesterly point at the mouth of Maple Swamp, bearing approximately 130°T and terminating on the southerly side of Ludlam Bay.
- (e) all of Ludlam Thorofare from Ludlam Bay to Townsend Channel.
- (f) all of Sunks Creek and tributaries not including Ware Thorofare.

30. Avalon Area

- (a) all of Avalon (Canfield) Canal.
- (b) all of Cornell Harbor.
- (c) all of Pennsylvania Harbor.
- (d) all of Princeton Harbor.
- (e) all of Graven Thorofare and tributaries.

- (f) all the stream between Avalon (Canfield) Canal and Long Reach.
- (g) all of Ingram Thorofare and tributaries from the Avalon Road bridge southwesterly to a straight line beginning at the point of land at the confluence of Long Reach and Ingram Thorofare, bearing approximately 35°T terminating at the point of land at the confluence of Ingram Thorofare and Deep Thorofare.
- (h) all of South Channel from a straight line beginning at the point (on the un-named island) of confluence with North Channel, bearing approximately 138°T terminating on the opposite side of South Channel in a westerly direction to a straight line beginning on the northeast bank of the west entrance to South Channel (on the small island), bearing approximately 246°T terminating on the mainland at the entrance to Leonard Thorofare.
- (i) all of Leonard Thorofare in a southerly direction from the line specified in section (h) above (bearing 246°T).
- (j) Deep Thorofare from a straight line beginning on the northern bank at the entrance to Cat

Run and running across Deep Creek to the northern bank at the entrance to Leonard Thorofare. (Cat Run is not condemned) to a line across the mouth of Deep Thorofare at Paddy Thorofare meeting the northeast end of the line across the mouth of Ingram Thorofare.

31. Stone Harbor Area

- (a) all of Gull Island Thorofare, Cresse Thorofare and Great Channel south and east from a straight line beginning at Halfmile Point, bearing approximately 110°T passing across the northern tip of Gull Island and terminating on the easterly bank at the entrance to Sturgeon Hole to a straight line transecting Great Channel beginning on the southwest bank at the entrance to a small ditch on the northwest shore of Great Channel near inland waterway marker #80 bearing approximately 126°T passing across the island and terminating on the opposite shore of Great Channel.
- (b) all that body of water running parallel with Seven Mile Beach, not including tributaries.
- (c) all of Oldman Creek.

- (d) all of Oyster Creek.
- (e) all of Scotch Bonnett.
- (f) all that creek connecting Oyster Creek
and Scotch Bonnett.
- (g) all of Muddy Hole.
- (h) all of Stone Harbor Canal.
- (i) all of Hetty Creek.
- (j) all of Crooked Creek.
- (k) all of Mulford Creek and the creek connecting
it with Crooked Creek.

32. Jenkins Sound (Seasonal)

- (a) all that portion of Jenkins Sound contained
within a line beginning at the end of Shellbed
Landing Road, bearing approximately 093°T
to the northwest tip of the nearest island,
then bearing approximately 046°T to the
nearest point of land on the opposite side
of Nichols Channel, then bearing approxi-
mately 305°T to the northern bank at the
mouth of the creek north of Benny's Landing;
shall be condemned for the harvest of shell-
fish from May 1. through October 31, of each
year and shall be approved for the harvest
of shellfish from November 1 through April 30,

of each year.

33. The Wildwoods Area

- (a) all of Hereford Inlet lying south from a straight line connecting the most southerly tip of Nummy Island and the most southerly tip of land on the north side of the inlet.
- (b) all of Grassy Sound Channel and tributaries not including Jenkins Channel.
- (c) all those waters lying between North Wildwood Blvd. and Jenkins Channel and Jenkins Sound including Gravelly Run and Turtle Gut.
- (d) all of Beach Creek and tributaries.
- (e) all of Grassy Sound and tributaries.
- (f) all of Turtle Thorofare and tributaries.
- (g) all of Tempe Creek and tributaries.
- (h) all of Cresse Creek and tributaries.
- (i) all of Richardson Sound and tributaries.
- (j) all of Post Creek and Ottens Harbor and tributaries.
- (k) all of Sunset Lake and tributaries.
- (l) all of Richardson Channel and tributaries.
- (m) all of Swain Channel and tributaries.
- (n) all of Taylor Sound and tributaries including Jones Creek.

(o) all of Reubens Thorofare and tributaries.

(p) all of Jarvis Sound and tributaries.

34. Cape May Area

(a) all of Upper Thorofare and tributaries.

(b) all of Middle Thorofare and tributaries.

(c) all of Lower Thorofare and tributaries.

(d) all of Cape May Inlet (Cold Spring Inlet).

(e) all of Cape May Harbor (Cold Spring Harbor).

(f) all of Skunk Sound and tributaries.

(g) all of Cape Island Creek and tributaries.

(h) all of Cape May Canal and tributaries.

35. Delaware Bay Area

(a) all that portion of Delaware Bay contained within a line beginning at the pumping station at the mouth of Fishing Creek, Cape May County and extending into the bay for one nautical mile on a bearing of 295°T, then continuing on a bearing of approximately 196°T to Fl. light #5 at Crow Shoal, then continuing to Cape May Lighthouse and terminating. The closure includes all tributaries flowing into the above described area including Fishing Creek, Cox Hall Creek and Pond Creek.

- (b) all of Dias Creek.
- (c) all of Bidwell Creek and tributaries shall be condemned for the harvest of shellfish from May 1, through October 31, of each year and shall be approved for the harvest of shellfish from November 1, through April 30, of each year.
- (d) all of Dennis Creek and tributaries including Roaring Ditch upstream from a line beginning on the southwest bank at the entrance to Roaring Ditch and bearing 149°T to the opposite shore of Dennis Creek. That portion of Dennis Creek downstream from the above described line shall remain approved for the harvest of shellfish.
- (e) all of East Creek and tributaries.
- (f) all of Riggins Ditch and tributaries.
- (g) all of Maurice River and tributaries and that portion of Maurice River Cove north and east from a straight line known as the "Summer Line" beginning at the lighthouse on East Point and bearing 311°T to a marker on the western bank at the mouth of New England Creek.

- (h) all of Dividing Creek and tributaries upstream from a line beginning on the northerly bank at the entrance to Hansey Creek and bearing 217°T to the opposite shore of Dividing Creek. That portion of Dividing Creek and tributaries downstream from the above described line shall remain open for the harvest of shellfish.
- (i) all of Fortesque Creek and tributaries from the mouth to the confluence of each of its branches with Oranoaken Creek. Oranoaken Creek shall remain approved for the harvest of shellfish downstream from "The Glades".
- (j) all the waters known as The Glades north from their confluence with Weir Creek, including that portion of Oranoaken Creek north from Weir Creek. Weir Creek shall remain approved for the harvest of shellfish.
- (k) all of Nantuxent Creek (Cumberland County) and tributaries upstream from a straight line beginning at the Fl. light on the southern bank at the mouth of Nantuxent Creek and bearing approximately 003°T to the mouth of the small ditch on the opposite shore of

Nantuxent Creek.

- (1) all of Cedar Creek (Cumberland County) and tributaries upstream from a straight line beginning at the point of land on the southern bank and the entrance to Cedar Creek and bearing approximately 003°T to the opposite shore of Cedar Creek.
- (m) all of Cohansey River and tributaries upstream from a straight line beginning at the most easterly point of land on the island at the mouth of Cohansey River and bearing 330°T to the opposite shore of Cohansey River and from a straight line from the outer range light marking the entrance to Cohansey River to the most westerly point of the same island.

* * * *

APPENDIX II

NEW JERSEY STREAM CLASSIFICATION

1. Water Quality Criteria

2. Classification-Atlantic Coastal Basin
3. Wastewater Treatment Requirements
4. Typical Pollution Abatement Order Under
Classification

RULES AND REGULATIONS

* * *

REGULATIONS ESTABLISHING CERTAIN CLASSIFICATIONS TO BE
ASSIGNED TO THE WATERS OF THIS STATE AND STANDARDS OF QUALITY
TO BE MAINTAINED IN WATERS SO CLASSIFIED.

WHEREAS, Chapter 12 of Title 58 of the Revised Statutes of
New Jersey (N. J. S. A. 58:12-3) provides that no
plant for the treatment of domestic or industrial
wastes or other polluting substance, from which
the effluent is to flow into any of the waters of
this State, shall be constructed except under such
conditions as shall be approved by the State Depart-
ment of Health, and

WHEREAS, The conservation of the quality and function of the
waters of the streams of this State into which
effluents from sewerage facilities are discharged
and the minimizing of pollution of these waters is

the overriding consideration of the Department of Health of the State of New Jersey in its considerations of the approvals of designs for such treatment works, and

WHEREAS, The maintenance of reasonable quality of the waters of the streams of this State is the primary basis upon which the State Department of Health approves of the design of proposed sewerage facilities, and

WHEREAS, The Interdepartmental Committee on Stream Pollution Control Problems, established by the State Commissioners of Health and Conservation and Economic Development, on April 9, 1964, recommended certain classifications be assigned to the waters of this State and standards of quality to be maintained in waters so classified, be promulgated as regulations by the State Department of Health, and

WHEREAS, The State Department of Health has determined that classifications of the waters of this State and standards of quality to be maintained in such waters as proposed and recommended by the Interdepartmental Committee on Stream Pollution Problems in this State are reasonable and constitute a valuable administrative instrument to the Department in

the administration of the New Jersey Stream Pollution Control Program,

NOW THEREFORE, The State Department of Health, pursuant to authority vested in it, promulgates the following regulations establishing certain classifications to be assigned the waters of this State and standards of quality to be maintained in such waters which are to be implemented from time to time by further regulations promulgated after public hearing defining the water or waters of this State to be assigned certain classifications and standards of quality to be maintained in such waters.

NEW JERSEY STATE DEPARTMENT OF HEALTH

Roscoe P. Kandle, M.D.

State Commissioner of Health

Filed with Secretary of State: August 10, 1964

Effective Date: September 1, 1964

* * *

(COPY)

REGULATIONS ESTABLISHING CERTAIN CLASSIFICATIONS TO BE
ASSIGNED TO THE WATERS OF THIS STATE AND STANDARDS OF
QUALITY TO BE MAINTAINED IN WATERS SO CLASSIFIED.

Fresh Waters

The fresh non-tidal surface waters of the State are herein classified as Classes FW-1, FW-2, FW-3 and FW-4. For each classification there follow definitions and stream quality criteria.

Class FW-1

Definition: Fresh surface waters designated by authorized State Agencies as being set aside for posterity to represent the natural aquatic environment and its associated biota.

Criteria

These waters shall be maintained, as to quality, in their natural state.

Class FW-2

Definition: Fresh surface waters approved as sources of public potable water supply. These waters are to be suitable for public potable water supply after such treatment as shall be required by the State Department of Health. These waters shall be suitable also for all recreational purposes including fishing, the propagation of native fish species desired for angling and other fish and aquatic life necessary thereto as well as any other reasonable uses.

Criteria

<u>Conditions</u>	<u>Allowable Limits</u>
1. Floating solids, settleable solids, oil, grease, artificial coloring matter and turbidity.	None of which are noticeable in the water or are deposited along the shore or on the aquatic substrata in quantities detrimental to the natural biota. None which would affect humans or be detrimental to the natural aquatic biota.
2. Toxic or deleterious substances (including mineral acids, caustic alkali, cyanides, heavy metals, carbon dioxide, ammonia or ammonium compounds, chlorine, etc.)	None which are offensive to humans, detrimental to the aquatic biota or capable of producing offensive tastes and/or odors in water supplies and fauna used for human consumption.
3. Odor and taste producing substances.	Between 6.5 and 8.5 unless naturally outside thereof.
4. pH	Not less than 5.0 p.p.m. for trout waters; otherwise 4.0 p.p.m.
5. Dissolved oxygen	

6. Thermal discharges. None which detrimentally affect the natural aquatic biota, or reasonably anticipated reuse of the water.

Class FW-3

Definition: Fresh surface waters suitable for all purposes provided for under ClassFW-2 except public potable water supply.

Criteria

<u>Conditions</u>	<u>Allowable Limits</u>
1. Floating solids, settle- able solids, oil, grease and turbidity.	None which are noticeable in the water or are deposit- ed along the shore or on the aquatic substrata in quantities detrimental to the natural biota.
2. Toxic or deleterious sub- stances (including mineral acids, caustic alkali, cya- nides, heavy metals, carbon dioxide, ammonia or	None which would affect humans or be detrimental to the natural aquatic biota

ammonium compounds, chlorine, etc.).

- | | |
|--|---|
| 3. Color, odor and taste producing substances. | None which are offensive to humans, detrimental to the aquatic biota or capable of producing offensive tastes and/or odors in fauna used for human consumption. |
| 4. pH. | Between 6.5 and 8.5 unless naturally outside thereof. |
| 5. Dissolved oxygen. | Not less than 5.0 p.p.m. for trout waters; otherwise 4.0 p.p.m. |
| 6. Thermal discharges. | None which detrimentally affect the natural aquatic biota, or reasonably anticipated reuse of the waters. |

Class FW-4

Definition: Fresh surface waters except as provided for under Classes FW-1, FW-2 and FW-3. These waters are to have limited recreational value and ordinarily not be acceptable for bathing or fishing but shall be able to

maintain some fish life even though they may not be suitable for the propagation of fish. These waters shall not be an odor nuisance and shall not cause damage to pleasure craft having occasion to traverse the waters.

Criteria

<u>Conditions</u>	<u>Allowable Limits</u>
1. Floating solids, settleable oil and grease.	None which are noticeable in the water or contribute to the formation of sludge deposits along the shores.
2. Toxic and deleterious substances.	None in such concentrations as to cause fish mortality or inhibit their natural migration.
3. Taste and odor producing substances.	None which shall be offensive or that would detrimentally affect fin-fish, shellfish or other aquatic life in higher quality receiving waters. Neither shall it inhibit the natural migration of fish.

4. Dissolved oxygen.

Not less than 50% saturation.

Tidal Waters

The tidal surface waters of the State, including interstate waters, are herein classified as Classes TW-1, TW-2 and TW-3. For each classification there follow definitions and stream quality criteria.

Class TW-1

Definition: Tidal surface waters suitable for all recreational purposes, as a source of public potable water supply where permitted, and, where shellfishing is permitted, to be suitable for such purposes.

Criteria

<u>Conditions</u>	<u>Allowable Limits</u>
1. Floating solids, settleable solids, oil, grease, sleet and turbidity.	None which are noticeable in the water or are deposited along the shore or on the aquatic substrata in quantities detrimental to the natural biota.

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|---|--|
| 2. Toxic or deleterious substances (including mineral acids, caustic alkali, cyanides, heavy metals, carbon dioxide, ammonia or ammonium compounds, chlorine, etc.) | None which would affect humans or be detrimental to the natural aquatic biota. |
| 3. Color, odor and taste producing substances. | None which are offensive to humans, detrimental to the aquatic biota or capable of producing offensive tastes and/or odors in water supplies and fauna used for human consumption. |
| 4. pH. | Between 6.5 and 8.5 unless naturally outside thereof. |
| 5. Dissolved oxygen. | Not less than 50% of saturation. |
| 6. Thermal discharges. | None which detrimentally affect the natural aquatic biota, or reasonably anticipated reuse of the waters. |
| 7. Coliform bacteria. | The median MPN value in shellfish growing areas |

shall not be in excess of
70 per 100 milliliters.

Class TW-2 (As amended and filed with Secretary of State
January 5, 1966. Effective date: March 1,
1966.)

Definition: Tidal surface waters having limited recreational value and ordinarily not acceptable for bathing but suitable for fish survival although perhaps not suitable for fish propagation. These waters shall not be an odor nuisance and shall not cause damage to pleasure craft having occasion to traverse the waters.

Criteria

<u>Conditions</u>	<u>Allowable Limits</u>
1. Floating solids, oil and grease.	None which are noticeable in the water or contribute to the formation of sludge deposits along the shores.
2. Toxic and deleterious substances.	None in such concentrations as to cause fish mortality or inhibit their natural migration.

- | | |
|---|--|
| 3. Taste and odor producing substances. | None, either alone or in combination, which are offensive or that would produce offensive tastes and/or odors in fauna used for human consumption. |
| 4. pH. | Between 6.5 and 8.5 unless naturally outside thereof. |
| 5. Dissolved oxygen. | Not less than 50% saturation. |
| 6. Thermal discharges. | None which detrimentally affect reasonably anticipated reuse of the waters. |

Class TW-3

Definition: Tidal surface waters used primarily for navigation, not recreation. These waters, although not expected to be used for fishing, shall provide for fish survival. These waters shall not be an odor nuisance and shall not cause damage to pleasure craft traversing them.

Criteria

<u>Conditions</u>	<u>Allowable Limits</u>
1. Floating solids, settleable solids, oil and grease.	None which are noticeable in the water or contribute to the formation of sludge deposits along the shores.
2. Toxic and deleterious substances.	None in such concentrations as to cause fish mortality or inhibit their natural migration.
3. Taste and odor producing substances.	None which shall be offensive or that would detrimentally affect fin-fish, shellfish or other aquatic life in higher quality waters.
4. pH.	Between 6.5 and 8.5 unless naturally outside thereof.
5. Dissolved oxygen.	Not less than 30% of saturation or 3.0 p.p.m., whichever is less.

Coastal Waters

The surf waters of the Atlantic Ocean are classified as Class CW-1.

Class CW-1

Definition: Ocean surf waters expected to be suitable for recreation use.

Criteria

<u>Conditions</u>	<u>Allowable Limits</u>
1. Floating solids, settleable solids, oil, grease and turbidity.	None of which are noticeable in the water or contribute to the formation of sludge deposits along the shores.
2. Toxic and deleterious substances.	None which would affect humans or be detrimental to the natural aquatic biota.
3. Color, taste and odor producing substances.	None which are offensive to humans, detrimental to aquatic biota or capable of producing offensive tastes and/or odors in fauna used for human consumption.

RULES AND REGULATIONS

* * *

The State Department of Health of the State of New Jersey, pursuant to the authority vested in it by Chapter 177, Laws of 1947, hereby amends that portion of Regulations Establishing Certain Classifications to be Assigned to the Waters of this State and Standards of Quality to be Maintained in Waters so Classified relating to Class FW-2, FW-4 and Coastal Waters filed with the Secretary of State on August 10, 1964.

STATE DEPARTMENT OF HEALTH OF THE STATE OF NEW JERSEY

/s/ Roscoe P. Kandle, M.D.
Roscoe P. Kandle, M. D.

State Commissioner of Health

Effective Date: May 1, 1967

Filed with Secretary of State: March 6, 1967

Class FW-2

Definition: Fresh surface waters approved as sources of public potable water supply. These waters are to be suitable for public potable water supply after such treatment as shall be required by the State Department of Health. These waters shall be suitable also for all recreational purposes including fishing, the propagation and migration

of native fish species desired for angling and other fish and aquatic life necessary thereto as well as any other reasonable uses.

Class FW-4

Repealed.

Coastal Waters

The waters of the Atlantic Ocean within 1500 feet from mean low tide or to a depth of 15 feet, whichever is more distant from the mean low tide line, are classified as CW-1.

The waters of the Atlantic Ocean not included under Class CW-1 are classified as CW-2, out to the three (3) mile limit.

Class CW-1

Definition: Ocean waters expected to be suitable for all recreational purposes including fishing, the propagation and migration of native fish species desired for angling and other fish and aquatic life necessary thereto as well as any other reasonable use.

Criteria

<u>Conditions</u>	<u>Allowable Limits</u>
1. Floating solids, settleable solids, oil, grease and turbidity.	None of which are noticeable in the water or contribute to the formation of sludge deposits along the shores.
2. Toxic and deleterious substances.	None which would affect humans or be detrimental to the natural aquatic biota.
3. Color, taste and odor producing substances.	None which are offensive to humans, capable of producing offensive tastes and/or odors in fauna used for human consumption.
4. pH.	Between 6.5 and 8.5 unless naturally outside thereof.
5. Dissolved oxygen.	Not less than 50% saturation.
6. Thermal Discharges.	None which detrimentally affect the natural aquatic biota.

Class CW-2

Definition: Ocean waters expected to be suitable for all recreational uses, including those in Class CW-1, except bathing.

Criteria

<u>Conditions</u>	<u>Allowable Limits</u>
1. Floating solids, settleable solids, oil, grease and turbidity.	None of which are noticeable in the water or contribute to the formation of sludge deposits along the shores.
2. Toxic and deleterious substances.	None which would affect humans or be detrimental to the natural aquatic biota.
3. Color.	None which would impair the quality of CW-1 waters or detrimental to aquatic biota.
4. Taste and odor producing substances.	None which are offensive to humans, or capable of producing tastes and/or odors in fauna used for human consumption.

- | | |
|------------------------|--|
| 5. Dissolved Oxygen. | Not less than 50% saturation. |
| 6. Thermal Discharges. | None which detrimentally affect the natural aquatic biota. |

REGULATIONS CONCERNING CLASSIFICATION OF THE
SURFACE WATERS OF THE ATLANTIC COASTAL PLAIN

WHEREAS, the State Department of Health of the State of New Jersey did promulgate "Regulations Establishing Certain Classifications to be Assigned to the Waters of this State and Standards of Quality to be Maintained in Waters so Qualified," effective September 1, 1964, and amended the said Regulations on January 5, 1966 and March 6, 1967, and

WHEREAS, in public hearings conducted by the State Department of Health on March 15, 22 and 29, 1967, classifications of the surface waters of the Atlantic Coastal Plain, as proposed by the State Department of Health, were presented to the general public, and

WHEREAS, the State Department of Health has given careful and thorough consideration to all statements submitted at said hearings, as well as statements and briefs

submitted thereafter, relating to the proposed
Classifications of the Surface Waters of the
Atlantic Coastal Plain,

NOW, THEREFORE, the State Department of Health promulgates
the following regulations entitled "Classification
of the Surface Waters of the Atlantic Coastal
Plain."

NEW JERSEY STATE DEPARTMENT OF HEALTH

Roscoe P. Kandle, M.D.

State Commissioner of Health

Filed with Secretary of State: April 27, 1967

Effective Date: May 24, 1967

CLASSIFICATION OF THE SURFACE WATERS OF THE
ATLANTIC COASTAL PLAIN

Pursuant to authority vested in it under the provisions of Chapter 12, Title 58 of the Revised Statutes, the State Department of Health hereby promulgates the following classifications of the surface waters of the Atlantic Coastal Plain. Standards of Quality to be maintained in these waters as established by the State Department of Health are attached hereto.

I. Class FW-1

Waters having the potential for this Class but which are not classified as such at this time may be recommended for such classification by public or private interests controlling the land area draining to the watercourse. Because of the restrictive-use nature of the FW-1 classification any waters thus designated must be contiguous with their source. Also, since the characteristics of surface waters are sometimes changed to the detriment of their natural biota by seemingly minor associations with domestic and/or agricultural activities, they must be inspected and approved before being classified. Requests for consideration in the classification of FW-1 waters should be directed to:

New Jersey State Department of Health
P. O. Box 1540
Trenton, N. J. 08625

A. FW-1 Manasquan River DrainageAllaireState Park

1. That portion of the second southerly tributary of the Manasquan River west of Hospital Road situated wholly within the Allaire State Park boundaries.

2. The easterly tributary of the
brook feeding Brisbane Lake
located wholly within the Allaire
State Park boundaries downstream
to its confluence with the westerly
tributary.

B. FW-1 Cedar Creek Drainage

Greenwood
Forest Fish
& Game Tract

1. Webbs Mill Branch and tributaries
situated wholly within the Green-
wood Forest boundaries.
2. Chamberlain's Branch and tributaries
situated wholly within the Green-
wood Forest boundaries upstream
from the blueberry farm exception,
also other tributaries to Chamber-
lain's Branch situated wholly with-
in the Greenwood Forest Tract
boundaries.

FW-1 Wading River Drainage

1. Westerly tributary of the Howards-
ville Cranberry Bog Reservoir and
tributaries thereto situated
wholly within the Greenwood Forest
Tract boundaries.

C. FW-1 Barnegat Bay Drainage

- Island Beach 1. All the fresh water ponds on
State Park Island Beach State Park.

D. FW-1 Manahawkin Creek Drainage

1. Tommy's Branch from its headwaters downstream to the Bass River State Forest Recreation Area service road.
2. Falkenburg Branch of Lake Absegami from its headwaters downstream to the lake.

E. FW-1 Mullica River Drainage

- Wharton 1. Deep Run and tributaries thereto
Tract from its headwaters downstream to Springer's Brook.
2. Skit Branch from its headwaters downstream to its confluence with Robert's Branch.
 3. Tulpehocken Creek and tributaries thereto from its origin downstream to its confluence with Featherbed Branch.

4. The westerly tributaries to Tulpehocken Creek and those natural ponds within the lands bounded by Hawkins Road, Hampton Gate Road, and Sandy Ridge Road.
5. Stream in the southeasterly corner of the Wharton Tract lying between Ridge Road and Seaf Weeks Road down to the Wharton Tract boundary.
6. Brook and tributaries between and immediately to the west of Tyler-town and Crowleytown from its headwaters downstream to the head of tide at mean high water.
7. The easterly branches of the Batsto River from Batsto Village upstream to the confluence of Skits Branch.
8. Gun Branch from its headwaters downstream to U. S. Route 206.

NOTE: All boundaries referred to as they existed December 1966.

TuckahoePublicHunting andFishingGrounds

1. Hawkins Creek and the next adjacent tributary to the Great Egg Harbor River lying to the north from their origin downstream to where the influence of impounding occurs.

II. Class FW-2

- A. Cranberry Brook and tributaries thereto upstream from the intake of the Monmouth Consolidated Water Company near the New York-Long Branch Railroad Crossing.
- B. Shark River and tributaries thereto upstream from Ramson's Mill Road.
- C. Jumping Brook and tributaries thereto above intake of Monmouth Consolidated Water Company near Old Corlies Avenue.
- D. Main stem of Manasquan River and tributaries thereto upstream from Garden State Parkway.
- E. All fresh waters of the Plain, from Manasquan River to and including the Mullica River, upstream from the head of tide.
- F. Absecon Creek and tributaries thereto upstream from Atlantic City Reservoir Dam in the City of Absecon.

- G. Patcong Creek and tributaries thereto upstream from Patcong Lake Dam.

III. Class FW-3

- A. Lake Takanassee

- B. Poplar Brook

Deal Lake and tributaries thereto

Sunset Lake and " "

Lake Wesley and " "

Fletcher Lake and " "

Sylvan Lake and " "

- C. Shark River and tributaries thereto downstream from Remson's Mill Road to head of tide.

- D. Jumping Brook and tributaries thereto downstream from Old Corlies Avenue to head of tide.

- E. Silver Lake and tributaries thereto

Lake Como " " "

Spring Lake " " "

Wreck Pond " " "

- F. Fresh water reaches of main stem of Manasquan River and tributaries downstream from Garden State Parkway.

- G. Absecon Creek and tributaries thereto downstream from above dam to head of tide.

- H. Patcong Creek and tributaries thereto downstream

from Patcong Lake dam to head of tide.

- J. All other fresh waters of the Plain not delineated upstream from head of tide.

IV. Class TW-1

- A. All tidal waters of Shark River and tributaries thereto from head of tide to surf waters.
- B. All tidal waters of Jumping Brook and tributaries thereto downstream from head of tide to Shark River and to surf waters.
- C. Tidal waters of main stem of Manasquan River and of tributaries thereto downstream from near the Garden State Parkway to surf waters.
- D. All other tidal waters of the Plain downstream from the head of tide to surf waters.

V. Class CW-1

Ocean waters within 1,500 feet from mean low tide to a depth of 15 feet, whichever is more distant from the mean low tide line, from Sandy Hook to Cape May Point.

VI. Class CW-2

Ocean waters of the Plain not included under Class CW-1 out to the "three mile limit."

Filed with the Secretary of State: April 27, 1967

Effective Date: May 24, 1967

REGULATIONS CONCERNING TREATMENT OF WASTEWATERS,
DOMESTIC AND INDUSTRIAL SEPARATELY OR IN COMBINA-
TION, DISCHARGED INTO THE WATERS OF THE ATLANTIC
COASTAL PLAIN, INCLUDING THE ATLANTIC OCEAN

WHEREAS, the State Department of Health is charged with the responsibility for the Water Pollution Control Program, including the approval of the designs of wastewater treatment facilities, in the State of New Jersey, and

WHEREAS, the citizens of this State, particularly the citizens in the Atlantic Coastal Plain, have been obliged in recent years to suffer repeatedly the consequences of serious oxygen depletion and other exemplifications of pollution in waters of the Atlantic Coastal Plain, said exemplifications of water pollution constituting threats to the public health, comfort or property of citizens of this State, and

WHEREAS, the State Department of Health did promulgate rules and regulations entitled "Regulations Establishing Certain Classifications to be Assigned to the Waters of this State and Standards of Quality to be Maintained in Waters so Classified," effective

September 1, 1964, and amended said rules and regulations on January 5, 1966 and March 6, 1967, and

WHEREAS, the State Department of Health has concluded after extensive investigations and analyses of factual data that more intensive treatment of wastewaters must be provided throughout the Atlantic Coastal Plain in order to attain water quality specified by the aforesaid regulations of the Department, and

WHEREAS, the State Department is of the opinion that the attainment and maintenance of water quality in the Atlantic Coastal Plain as specified by the aforesaid regulations of the Department is necessary in order to abate a present threat to the public health, comfort or property of citizens of this State,

NOW, THEREFORE, the State Department of Health promulgates the following regulations entitled "Regulations Concerning Treatment of Wastewaters, Domestic and Industrial, Separately or in Combination, Discharged into the Waters of the Atlantic Coastal Plain, including the Atlantic Ocean."

NEW JERSEY STATE DEPARTMENT OF HEALTH

Filed with Secretary of State: May 1, 1967

Effective Date: June 1, 1967

REGULATIONS CONCERNING TREATMENT OF WASTEWATERS,
DOMESTIC AND INDUSTRIAL SEPARATELY OR IN COMBINA-
TION, DISCHARGED INTO THE WATERS OF THE ATLANTIC
COASTAL PLAIN, INCLUDING THE ATLANTIC OCEAN

Pursuant to the authority vested in it under the provisions of Chapter 12, Title 58 of the Revised Statutes, the State Department of Health hereby promulgates the following regulations concerning treatment of wastewaters, domestic and industrial, separately or in combination, discharged into the waters of the Atlantic Coastal Plain.

I. Henceforth, domestic wastes, separately or in combination with industrial wastes, prior to discharge into waters of the Atlantic Coastal Plain classified as FW-2 or FW-3 or TW-1, shall be treated to a degree providing, as a minimum, ninety-five percent (95%) of reduction of biochemical oxygen demand at all times including any four-hour period of a day when the strength of the wastes to be treated might be expected to exceed average conditions; it is an objective of this regulation that the biochemical oxygen demand of effluents discharged shall not exceed 15 parts per million.

II. Henceforth, industrial wastes, prior to discharge into

waters of the Atlantic Coastal Plain, classified as FW-2, FW-3 or TW-1, shall be treated to a degree providing, as a minimum, ninety-five percent (95%) of reduction of biochemical oxygen demand at all times and such further reduction in biochemical oxygen demand as may be necessary to maintain receiving waters, after reasonable effluent dispersion, as specified in the rules and regulations entitled "Regulations Concerning Classification of the Surface Waters of the Atlantic Coastal Plain," effective May 24, 1967; it is an objective of this regulation that the biochemical oxygen demand of effluents discharged shall not exceed 15 parts per million.

III. Henceforth, domestic wastes, separately or in combination with industrial wastes, prior to discharge into waters of the Atlantic Coastal Plain classified as CW-1 or CW-2, shall be treated to a degree providing, as a minimum, eighty-five percent (85%) of reduction of biochemical oxygen demand at all times, including any four-hour period of a day when the average of the wastes to be treated might be expected to exceed average conditions; it is an objective of this regulation that the biochemical oxygen demand of effluents discharged shall not exceed 40 parts per million.

IV. Henceforth, industrial wastes prior to discharge into

waters of the Atlantic Coastal Plain, classified as CW-1 or CW-2, shall be treated to a degree providing, as a minimum, eighty-five percent (85%) of reduction of biochemical oxygen demand at all times and such further reduction of biochemical oxygen demand as may be necessary in order to maintain the receiving waters in a quality as specified by the rules and regulations entitled "Classification of the Surface Waters of the Atlantic Coastal Plain," effective May 24, 1967.

V. It is recognized, especially in connection with some industrial wastes, that the pollution load imposed upon the waters of the Plain cannot be evaluated fully exclusively by the biochemical oxygen demand test; therefore, each industrial waste problem shall be considered individually and treatment shall be required as needed to effect compliance with the Water Quality Criteria established for the various classifications of waters in the Plain.

VI. Treatment standards set by these regulations are the minimum acceptable for the Atlantic Coastal Plain.

Treatment more intensive than that specified hereinabove shall be provided whenever it is determined by the State Department of Health that such treatment is necessary.

Filed with Secretary of State: May 1, 1967

Effective Date: June 1, 1967

* * * *

Roscoe P. Kandle, M.D., M.P.H.

State Commissioner of Health

(Seal)

Richard J. Sullivan,

Director

Division of Clean Air

and Water

STATE OF NEW JERSEY

DEPARTMENT OF HEALTH

JOHN FITCH PLAZA, P.O. BOX 1540, TRENTON, 08625

ORDER

WHEREAS, the State Department of Health of the State of New Jersey did promulgate "Regulations Establishing Certain Classifications to be Assigned to the Waters of this State and Standards of Quality to be Maintained in Waters so Classified," effective September 1, 1964 and amended the said regulations on January 5, 1966 and March 6, 1967, and

WHEREAS, the State Department of Health of the State of New Jersey did after public hearings conducted by the Department on March 15, 22 and 29, 1967 promulgate regulations entitled "Regulations Concerning

Classification of the Surface Waters of the

Atlantic Coastal Plain," effective May 24, 1967, and

WHEREAS, the State Department of Health of the State of New

Jersey did promulgate regulations entitled

"Regulations Concerning Treatment of Wastewaters,

Domestic and Industrial Separately or in Combination,

Discharged into the Waters of the Atlantic Coastal

Plain, including the Atlantic Ocean," effective

June 1, 1967, and

WHEREAS, the State Department of Health of the State of New

Jersey has found through investigations made by its

representatives that the sewage treatment plant owned

and operated by the City of Pleasantville, in the

County of Atlantic and the State of New Jersey, does

not conform to the aforesaid regulations of the

State Department of Health, and is inadequate in

capacity or unit design to properly care for, treat

and dispose of the sewage received therein before an

effluent from the said sewage treatment plant is

discharged into the waters of the Lakes Bay, being

waters of the Atlantic Coastal Plain, being waters

of this State, thereby causing or threatening injury

to the inhabitants of this State either in their

health, comfort or property, and

WHEREAS, the State Department of Health of the State of New Jersey, in consideration of the aforesaid, is of the opinion that in order for the sewage to be properly, adequately and sufficiently treated at the said sewage treatment plant before an effluent is discharged into the said waters of this State, the said sewage treatment plant must be altered, added to or improved in a manner approved by the State Department of Health, and

WHEREAS, it is incumbent upon the State Department of Health of the State of New Jersey to be specific as to the minimum degree of sewage treatment meeting the approval of the said State Department of Health, and a timetable of significant events including the contemplated dates for the completion of construction of sewage treatment projects,

THEREFORE, NOTICE IS HEREBY GIVEN by the State Department of Health of the State of New Jersey pursuant to R. S. 58:12-2 to the City of Pleasantville, in the County of Atlantic and the State of New Jersey, requiring that the said City of Pleasantville must and shall, prior to November 30, 1970, cease the discharge of improperly, inadequately and insufficiently treated sewage into the waters of the Lakes Bay being

waters of the Atlantic Coastal Plain, being waters of this State, and must alter, add to or improve the sewage treatment plant operated by the City of Pleasantville, including sewage treatment units designed to provide at all times a minimum of ninety-five percent (95%) reduction in biochemical oxygen demand of the sewage received at the said sewage treatment plant, the biochemical oxygen demand of the effluent of said plant not to exceed fifteen (15) parts per million, or, if in lieu of the discharge of the effluent to the Lakes Bay an effluent is to be discharged into the Atlantic Ocean, then the treatment units shall be designed to provide at all times a minimum of eighty-five percent (85%) reduction in biochemical oxygen demand of the sewage received at the said sewage treatment plant, the biochemical oxygen demand of the effluent of said plant not to exceed forty (40) parts per million, and including units for effective year around effluent disinfection, in order that the sewage received therein shall be cared for, treated and disposed of and the effluent discharged in a manner approved by the State Department of Health of the State of New Jersey, and in order that the treatment and

disposal of said effluent shall meet the applicable standards of water quality described by regulations of the State Department of Health entitled "Regulations Concerning Classification of the Surface Waters of the Atlantic Coastal Plain," effective May 24, 1967, and, the regulations of the State Department of Health entitled "Regulations Concerning Treatment of Wastewaters, Domestic and Industrial Separately or in Combination, Discharged into the Waters of the Atlantic Coastal Plain, Including the Atlantic Ocean," effective June 1, 1967, and in effecting abatement of pollution of the waters of this State within the time hereinabove provided shall execute the following work performance schedule:

- (1) Complete an engineering report upon the proposed basis of design of additions and alterations with review and approval of same by the State Department of Health on or before April 30, 1968;
- (2) Complete preparation of and secure review and approval of preliminary engineering plans on or before October 30, 1968;
- (3) Complete preparation of and secure review and

approval of detailed contract plans and specifications on or before June 1, 1969;

- (4) Award construction contracts on or before October 1, 1969;
- (5) Complete construction on or before November 30, 1970;
- (6) The work performance scheduled herein shall be in conformity with the master engineering plan for sewerage services in the County of Atlantic as approved by the New Jersey State Department of Health and the design of any ocean outfall sewer shall be in conformity with a feasibility study and report upon the design of such ocean outfalls along the coast of Atlantic County as approved by the New Jersey State Department of Health.

STATE DEPARTMENT OF HEALTH OF THE STATE OF NEW JERSEY

/s/ Richard J. Sullivan, Director

Division of Clean Air and Water

Dated: June 16, 1967

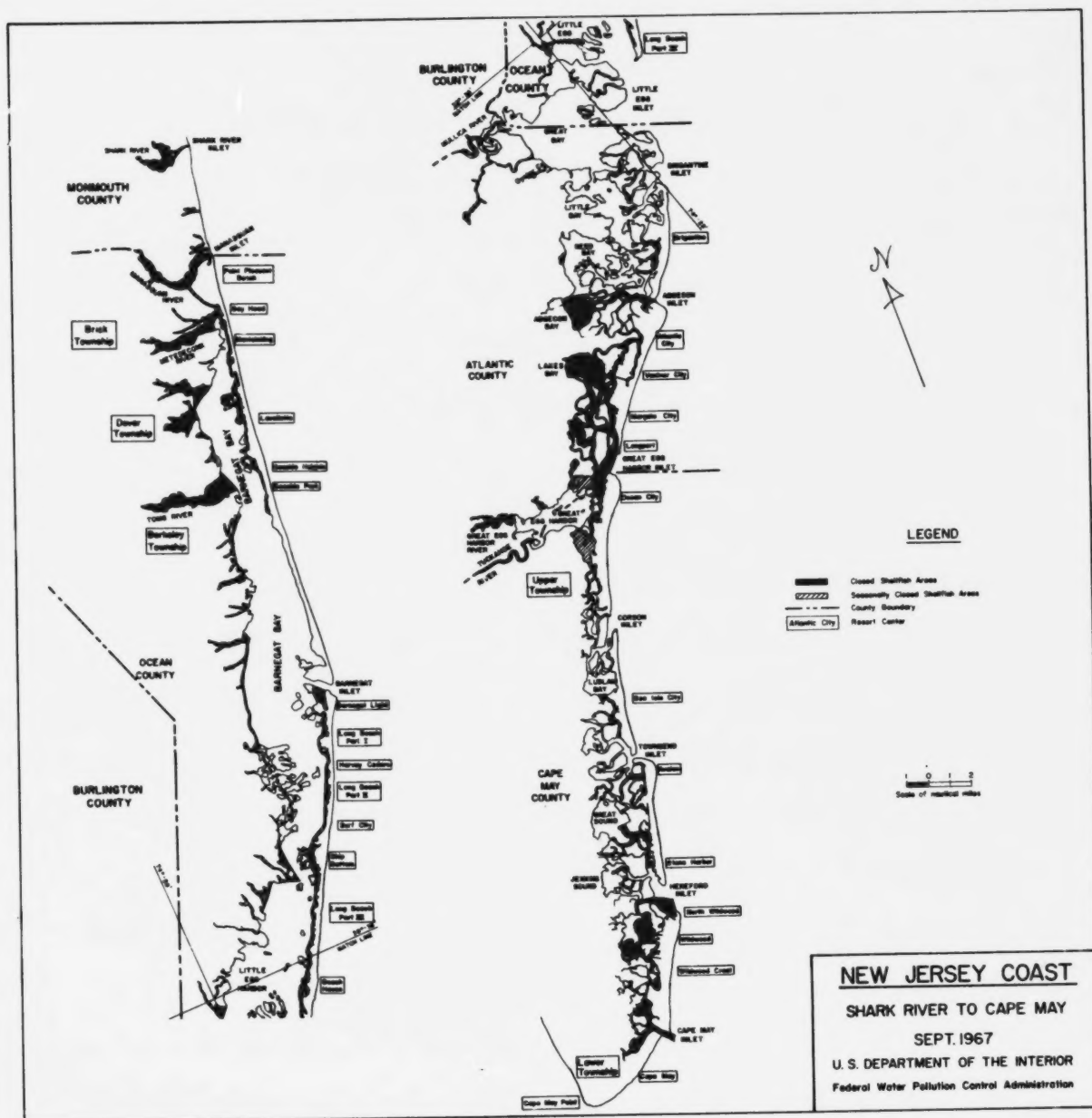


FIGURE 4

GPO 957-759

K. Walker

Mr. Chairman, that completes the report.

MR. STEIN: Are there any comments or questions on the report?

MR. KLASHMAN: No, I have none.

DR. KANDLE: I have none.

MR. KLASHMAN: Thank you very much.

MR. STEIN: I have a couple of clarifying ones.

MR. WALKER: Beg pardon?

MR. STEIN: Mr. Walker, I notice the economic report of Florida is often quoted, and you talk about a dock-side price of \$5.04 per bushel, and then you figure it is going to be four times as much retail.

I don't know what the retail operation entails, but when you run into men like myself, most of the clams I eat are eaten in restaurants, and the price that is current in Washington restaurants, at least in the circuit that I go to -- and I don't think they are the most expensive in the world -- is \$1.25 a half dozen.

If this is the case, I would suggest that your figures are very, very conservative. Because, again, with my rudimentary mathematics, figuring the price at \$1.25 a half dozen, when we talk in terms of value to the industry, consideration should be given to the restaurant price being paid for clams and oysters, since this is where a good many

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of us eat them.

MR. WALKER: You are quite right. We recognize that this figure is conservative, but we have used it in light of the fact that it is a documented case which is available for the record. However, it is well recognized that this is probably on the extremely conservative side.

MR. STEIN: I have a couple of other points.

On your Recommendation No. 8, you talk in terms of "restricted connections with the ocean."

Do you know if any consideration has been given to cutting through channels and providing a better flushing action here? Would that help? Could that be a part of the approach to the problem?

MR. WALKER: Specifically, I am not aware of any consideration being given down in this area. In the Sandy Hook area there is a project under consideration, but that does not apply to this.

MR. STEIN: I know that in Long Island and in several other instances, a part of the total program to maintain the quality of the inland waters which we have up and down the Eastern Coast, includes a maintenance of channels to help with the flushing action.

In various of these areas, if you are going to have a relatively closed system, the chances of keeping

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pollution from nutrients out, even given the best conditions, may be minimized. I was wondering about that.

MR. KLASHMAN: Mr. Stein, if you want to pursue that further, we are going to have a statement by Colonel Watling, who is the District Engineer from the Philadelphia District office, who can explore this a little further with us.

MR. STEIN: Yes.

Now, I am sure you well know the jurisdiction and the limitations we are under here in dealing with the shellfish industry. In my opinion, the program of New Jersey for 85 or 95 percent treatment, with effective year-round disinfection, is as good as we have anywhere in the country. I think that in New Jersey the program is as vigorous as any we have. I don't believe there is any problem with that.

As far as I can see, we are dealing with a peculiar situation. Because of the nature of the shellfish industry and the geographical location of the waters from which they are harvested, we don't want any effluents, however well treated, to be discharged into those waters. In other words, we want that treated effluent either put into the ground or gathered up and put into a certain limited area, so that we can open the

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others.

Is that correct?

MR. WALKER: This is correct. Because of the possibility of human or mechanical failure at some time where a treatment plant will fail to provide its designed amount of treatment, the regulations at the moment call for any beds that are within one tidal cycle of a discharge from a waste plant or other source of pollution are automatically closed to shellfish harvesting, so that even with high degrees of treatment, you haven't eliminated the possibility of a plant failure, and this condition can only be corrected by the removal of the source of pollution.

MR. STEIN: I think we will probably hear from the Public Health Service later, and, of course, Dr. Kandle is here. As many of you know, we have a rather closed society in this business. A good many of the people have worked together for years.

I have worked with the shellfish program and its people. I think they have their regulations and requirements, and are doing a superb job in protecting the public. I don't know that anyone would suggest that they change their requirements at all to make them less restrictive. But I do think if we follow Mr. Walker's point, in dealing with a waste treatment plant, what we are really relying upon, as we do in most things in

this life, are men and machines, and we do know that men and machines fail every once in a while. As a matter of fact, if they did not fail we would be surprised, given the best of the systems.

Therefore, I think the public health authorities in their cooperative program have indicated that any effluent which contains treated human wastes, no matter how well they are treated, within the tidal cycle of a shellfish bed would make that bed off limits, so to speak, and not available for harvesting and shipment in interstate commerce.

Therefore, if we are talking in terms of the shellfish industry, in the New Jersey situation we have to recognize a requirement that will go over and beyond what we would consider to be a very good program for a normal State agency. I think the program as outlined here from New Jersey meets the highest specifications.

The question here becomes one of a real difficult resource management program, and this may be why we are here with the State. That is, do you gather the effluent up and decide to put it in a few places where you won't harvest shellfish?

This does not mean that the waters will not be available for all other uses in those points, because this effluent is going to be highly treated and disinfected. The

only water use that you will not be able to make within one tidal cycle of the effluent is the harvesting of shellfish.

If you don't do that, the question is, dealing with this program, how much of this area will be open for shellfish harvesting, and the relation to that might be pessimistic.

In other words, if we are talking in terms of getting a real expanded shellfish growing and harvesting area here available for interstate shipment of shellfish, we have to think from the Federal, State and local level of providing an extra effort, and the kind of effort that we really don't ask other State agencies or municipalities to do.

This is the point I want to emphasize. By the very nature of the problem, we are looking at a program where your recommendations are for a program that is over and above what would almost anywhere else be considered a superb State program for pollution control.

Do you want to comment on that?

MR. WALKER: No.

MR. STEIN: This is the key issue here.

Thank you.

MR. KLASHMAN: Mr. Walker, before you leave, as I understand it, you are well aware of the fact, you have told me, that in the event that provision were made for

discharging outside the barrier, you are concerned very much about the effect it might have on the surf clam industry, and it would be our intent to work very closely with the Bureau of Commercial Fisheries and the Public Health Service to see that this phase of the injury were not injured.

Is that correct?

MR. WALKER: Yes, Mr. Klashman, it is.

MR. STEIN: Thank you very much.

If there are no further comments or questions, Mr. Klashman?

MR. KLASHMAN: I would now like to call on Lester Sutton, Director of our Facilities Program, Northeast Region, of the Federal Water Pollution Control Administration.

Mr. Sutton.

STATEMENT OF LESTER A. SUTTON, FACILITIES
PROGRAM DIRECTOR, NORTHEAST REGION, FEDERAL
WATER POLLUTION CONTROL ADMINISTRATION,
DEPARTMENT OF THE INTERIOR

MR. SUTTON: I would like to say a few words regarding two of the Federal Water Pollution Control Administration programs which are concerned with the construction of required sewage treatment facilities, with particular

emphasis on this New Jersey coastal area.

First, the Federal construction grants program:

Under the provisions of Section 8 of the Federal Water Pollution Control Act, grants are available to aid municipalities in the construction of sewage treatment facilities. This program is administered in accordance with the law in close cooperation with the New Jersey State Department of Health. The State is responsible for the determination of priorities in assignment of these Federal grants.

This Federal grant program has been of assistance to many municipalities in the construction of the sewage treatment facilities which are essential to the abatement of pollution of our Nation's waters. In the area covered by this conference, we have provided \$4,518,000 in Federal grants to aid in the construction of 22 projects having a total cost of \$12,775,000. Enclosed with your copy of the Conference Report is a tabulation giving details regarding these projects. I would like to have this tabulation inserted as part of the official record.

MR. STEIN: Without objection, that will be inserted as if read.

MR. SUTTON: I might say if many of you did not receive that tabulation with your blue conference report, copies should be available at the table outside.

The second program I would like to discuss is the Federal activities coordination program, which deals with Federal installations.

Executive Order 11288 requires heads of Federal departments, agencies and establishments to provide the leadership example in the national effort to improve water quality through the prevention, control and abatement of water pollution from Federal activities in the United States. The Order requires the Secretary of the Interior to provide the necessary review, coordination and technical advice and assistance to the efforts of the Federal departments, agencies and establishments which, in turn, are required to cooperate with the Secretary and with State, interstate and municipal agencies.

Program responsibility for the Secretary's functions has been assigned to the Federal Water Pollution Control Administration, whose regional offices have primary operational responsibility within their respective regions. The Northeast Region has established, within the Facilities Program, a Division of Federal Activities Coordination, whose responsibility it is to implement the provisions of this Executive Order. This Division will be working closely with other Federal agencies to abate pollution from their installations.

There are five Federal installations in this

enforcement area which discharge to surface waters. These are as follows:

1. Camp Evans (Army) at Wall Township
2. Naval Air Station at Lakehurst
3. Naval Reserve Training Center at Atlantic City
4. National Aviation Facilities Experimental Center at Pomona (FAA)
5. Cape May Coast Guard Station at Cape May.

The FAA Experimental Center provides secondary treatment and chlorination, while the others provide primary treatment and chlorination. The following is a brief summary of the present waste treatment facilities and future pollution abatement plans at these installations:

1. Camp Evans

This Army post has a secondary treatment plant with single stage biofiltration. The design flow for the plant was 0.5 mgd but the present average flow is only about 0.03 mgd. Because present flows are considerably below the design flow, only the primary portion of this plant and chlorination can be utilized. However, due to long detention times, a higher degree of treatment is achieved. Effluent is discharged to the Shark River.

2. Lakehurst Naval Air Station

This primary plant presently discharges about 0.2 mgd of chlorinated primary effluent to the Ridgeway Branch of the Toms River. Several years ago a project was initiated to add secondary treatment facilities at an estimated cost of \$200,000. Design work is expected to be completed by December 22, 1967, after which the project will be subject to review by the FWPCA in consultation with the State of New Jersey. Construction funds have been budgeted for fiscal year 1968. If these funds are provided as scheduled, construction would begin in the summer of 1968, and the plant would be completed and in operation by the summer of 1969.

Catapult operations at this station generate 0.15 mgd of waste water. This is discharged to the Base storm water drainage system. This water contains some oily wastes from these operations. Treatment devices to remove this oil are currently under design and are expected to be installed and in operation on or before July 1, 1969.

3. Atlantic City Naval Reserve Training Center

This installation provides treatment using septic tanks with post chlorination. The effluent discharges to Absecon Inlet. The Center has ten personnel on duty five days a week and services another 125 people each week who

attend evening meetings. In addition, these men spend one weekend a month on duty at the installation. The average daily flow is estimated at only about 500 gpd, or 0.0005 mgd.

4. National Aviation Facilities Experimental Center - Pomona

The present plant provides secondary treatment with post chlorination of about 0.1 mgd with discharge to Gravelly Run and thence to Great Egg Harbor. It has an excellent operating record.

5. Cape May Coast Guard Station

This facility has tied in all of their sanitary wastes which it generates to the Cape May municipal system, except for a small amount which is discharged to isolated subsurface disposal systems.

The only discharge to surface waters which now occurs is an occasional discharge of filter backwash at the swimming pool. A new swimming pool is proposed which will be completed by June 1970. This new pool, replacing the old one, will discharge filter backwash water to the municipal system.

New standards of water quality may require these Federal installations to improve their treatment methods and processes further. These Federal agencies have assured

us of their intent to cooperate within their capabilities with all State, local and regional planning groups and sewage authorities, to provide acceptable levels of treatment.

That concludes the statement. I just have a few copies of the statement which I will place here for anyone who might be interested.

PROJECTS
IN
JERSEY COASTAL AREA
AIDED BY
FEDERAL CONSTRUCTION GRANTS PROGRAM

October 23, 1967

Project Name	Number	Description	*Eligible Cost	*Grant	Status
<u>ATLANTIC COUNTY</u>					
Somers Point City Sewerage Authority	WPC-NJ-56	Interceptor Sewer and Sewage Treatment Plant	\$ 814,000	\$ 244,000	Completed 9-10-64
City of Brigantine	WPC-NJ-84	Pumping Station and Interceptor Sewer	452,000	136,000	Completed 6-29-64
City of Pleasantville	APW-NJ-127	Pumping Station, Interceptor Sewer, additions and altera- tions to existing Sewage Treatment Plant	1,111,000	247,000	Completed 8-25-66
Hamilton Township Municipal Utilities Authority	WPC-NJ-143	Pumping Stations, Force Main, Interceptor Sewers & Sewage Treatment Plant	896,000	269,000	53% Complete 5-12-67
Town of Hammonton	WPC-NJ-189	Additions & Alterations to existing Sewage Treatment Plant	795,000	239,000	Completed 8-22-67
Sub-Total			\$4,068,000	\$1,135,000	
<u>BURLINGTON COUNTY</u>					
None					
<u>CAMDEN COUNTY</u>					
Borough of Berlin	WPC-NJ-131	Pumping Stations, Force Main & Sewage Treatment Plant	\$ 408,000	\$ 122,000	Completed 11-26-65
Sub-Total			\$ 408,000	\$ 122,000	

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Project Name	Number	Description	*Eligible Cost	*Grant	Status
<u>CAPE MAY COUNTY</u>					
City of North Wildwood	WPC-NJ-7	Additions & Alterations to Sewage Treatment Plant	\$ 280,000	\$ 84,000	Completed 5-3-60
Avalon Sewerage Authority	WPC-NJ-8	Force Main, Sewage Treatment Plant and Outfall Sewer	488,000	135,000	Completed 2-20-59
Borough of Wildwood Crest	WPC-NJ-16	Pumping Station, Force Main, Sewage Treatment Plant & Outfall Sewer	577,000	173,000	Completed 7-21-61
City of North Wildwood	WPC-NJ-48	Extension of existing Outfall Sewer	19,000	6,000	Completed 6-22-61
City of Wildwood	WPC-APW-NJ-62	Screening and grit removal device at Main Pumping Station	126,000	63,000	Completed 1-23-64
Borough of Wildwood Crest	APW-NJ-90	Pumping Stations & Force Mains	149,000	75,000	Completed 2-23-64
Borough of West Wildwood	WPC-APW-NJ-125	Pumping Station & Force Main	69,000	33,000	Completed 7-2-64
Sub-Total			\$1,708,000	\$ 569,000	
<u>GLOUCESTER COUNTY</u>					
Monroe Municipal Utilities Authority	WPC-NJ-20	Sewage Treatment Plant	\$ 300,000	\$ 90,000	Completed 6-15-61
Sub-Total			\$ 300,000	\$ 90,000	

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Project Name	Number	Description	*Eligible Cost	*Grant	Status
<u>MONTMOUTH COUNTY</u>					
Borough of Freehold	WPC-NJ-18	Additions & alterations to Sewage Treatment Plant	\$ 403,000	\$ 121,000	Completed 3-20-62
Township of Neptune	** APW-NJ-106	Interceptor Sewers and Sewage Treatment Plant	2,898,000	1,429,000	Completed 10-12-66
Sub-Total			\$3,301,000	\$1,550,000	
<u>OCEAN COUNTY</u>					
Borough of Ship Bottom	WPC-NJ-1	Sewage Treatment Plant & Outfall Sewer	\$ 350,000	\$ 96,000	Completed 11-12-58
Borough of Lakehurst	WPC-NJ-82	Pumping Station, Force Main and additions and alterations to existing Sewage Treatment Plant	256,000	77,000	Completed 2-24-65
Tuckertown Municipal Utilities Authority	WPC-NJ-96	Pumping Stations, Force Main, Sewage Treatment Plant & Outfall Sewer	460,000	138,000	Completed 8-10-65
Dover Sewerage Authority	APW-NJ-104	Sewage Treatment Plant & Outfall Sewer	954,000	477,000	Completed 5-21-65
Berkeley Township Sewerage Authority	WPC-NJ-175	Pumping Stations, Interceptor Sewers, 2 Sewage Treatment Plants and Outfall Sewers	923,000	250,000	Completed 12-15-66

** (Area served is adjacent to the Shark River, Outfall discharges to Ocean North of Shark River)

Project Name	Number	Description	*Eligible Cost	*Grant	Status
<u>OCEAN COUNTY (cont'd)</u>					
Long Beach Sewerage Authority	WPC-NJ-181	Pumping Station and Force Main	\$ 47,000	\$ 14,000	Completed 7-1-66
		Sub-Total	\$2,990,000	\$1,052,000	
TOTAL	22 Projects	Grand Total	\$12,775,000	\$4,518,000	

* Rounded to nearest thousand

L. A. Sutton

MR. STEIN: Thank you, Mr. Sutton.

Are there any comments or questions?

DR. KANDLE: Mr. Chairman, could we be clear about the time during which the \$4,518,000 was provided?

MR. SUTTON: Those funds are the total provided since the enactment of our legislation back in 1956, so that would be approximately eleven years.

MR. STEIN: Are there any further questions or comments?

(No response.)

MR. STEIN: Mr. Sutton, as I see this, except for the Cape May Coast Guard Station, which may be in good shape since they are going to be hooked up completely to a municipal system, all the other four, Camp Evans, Lakehurst, Atlantic City Naval Reserve Training Center, and the National Aviation Facilities Experimental Center at Pomona, discharge into estuary or tributary waters?

MR. SUTTON: Yes.

MR. STEIN: They don't discharge into the ocean.

I recognize that the Federal installations probably have a relatively small load compared to the other loads coming in from your other sources in the area, but I think the Federal policy is clear that the Federal group should show the way, and I see nothing in any one of these four to

indicate that they are going to meet the 95 percent removal of their wastes plus chlorination on a year-round basis.

Is that your policy, to see that they do that?

MR. SUTTON: The extent of treatment has not been resolved with these installations yet. Generally, they are cooperative and have agreed to secondary.

MR. STEIN: Let me read the recommendation. If they are discharging their wastes into estuaries or tributaries, and there are at least four here, the New Jersey requirements are going to be that they receive a minimum treatment of all kinds of 95 percent removal of BOD and year-round disinfection, which is contained in their orders. Construction is to be initiated on or before October 1, 1969, and to be completed on or before November 30, 1970.

If this is a requirement that New Jersey is imposing on the municipal and other installations in the area under its jurisdiction, what do you think our position is going to have to be with the Federal installations?

MR. SUTTON: I think it is obvious that we would certainly have to recommend that the Federal installations do at least as well as the State is requiring of municipalities in the area.

MR. STEIN: Within the time schedule?

MR. SUTTON: Yes.

MR. STEIN: Now, I have one more question.

You talked about the Federal installations and you listed five discharging into surface waters.

We have also, as we heard Mr. Walker, made a recommendation with regard to individual septic tanks and cesspools.

If we have recommended a control of that on the State level, are there any Federal installations not listed that have septic tanks and cesspools and are discharging into underground waters?

MR. SUTTON: I believe there are. I don't have any record of that.

In most cases, they are probably very extremely small.

MR. STEIN: I know. We have had these in the past. I think again, we have to face this. If we go down to the smallest NIKE site--and I just say this because I know there are Federal representatives in the room and you are working with the Federal program--I don't think we can in good conscience make a strong recommendation, such as Recommendation No. 11 of the Federal Report, which talks about control of individual septic tanks and cesspools in this area because of the particular nature of this, without making a list of every one of the Federal installations, no matter how small, to see

if we are doing this, because it has got to be at least the size of a house. I am pretty sure that we are going to have to come up with a uniform rule and approach this with clean hands if we are going to make a recommendation to the State and the local industries and local home owners. I think the Federal housing is going to have to be in order.

Are there any further comments or questions?

MR. KLASHMAN: No, I have none.

MR. STEIN: Thank you very much for a complete report.

We will stand recessed for ten minutes.

(Whereupon a recess was had.)

MR. STEIN: May we reconvene?

Mr. Klashman?

MR. KLASHMAN: I should now like to call on Mr. Mark Abelson, Regional Coordinator, United States Department of the Interior.

Mr. Abelson.

STATEMENT OF MARK ABELSON, REGIONAL COORDINATOR,
UNITED STATES DEPARTMENT OF THE INTERIOR

MR. ABELSON: Mr. Stein, Conferees, Ladies and
Gentlemen:

I am Mark Abelson, Regional Coordinator, for the Northeast Region, United States Department of the Interior.

The Department of the Interior is the Nation's primary agency charged with responsibility for a wide variety of programs for the management, conservation, and development of the natural resources which benefit every section of the Nation. For this reason, it can best be described as the "Department of Natural Resources."

The Department is made up of some three dozen bureaus and offices, whose functions and responsibilities cover the entire range of natural and human resources. In the Northeast, coordination of these functions and responsibilities is accomplished through my office in Boston.

The broad scope of the Department's functions is indicated by the following brief listing of its principal activities: The Department has direct responsibility for some 550 million acres of Federally-owned lands and administers the mining and mineral leasing laws on other lands; it irrigates more than eight million acres of reclaimed lands in the West; manages hydroelectric power systems with a capacity of approximately 13 million kilowatts; protects fish and wildlife resources; conserves hundreds of vital scenic, historic, and park areas; coordinates and advances outdoor recreation programs; conducts geologic research, hydrologic

M. Abelson

investigations, and topographic surveys; promotes more efficient mining and processing methods and mine safety; encourages mineral exploration and conducts mineral, fuel, and saline water research; provides grants for water resources research; administers the oil import programs; operates helium plants; works for the welfare of about 180,000 people in areas administered by the United States; exercises trusteeship for the well-being of about 380,000 Indians, Aleuts and Eskimos along with resource management on about 50 million acres of Indian-owned lands; and administers grants, conducts research, and administers enforcement provisions for water pollution control.

In carrying out these vital responsibilities for sound management of natural resources, the Department encourages efficient resources use; works to assure that a sound resource base is provided to meet the needs of our expanding economy, our national security, and our future needs; promotes an equitable distribution of benefits from nationally-owned resources; and seeks to prevent wasteful exploitation of resources.

The Department has a definite interest in all waters of the country and in the entire pollution problem.

Water, and its associated opportunities and problems, ignore State, regional and international boundaries.

It is important that the interrelationships of water be so recognized and that the efforts of all concerned plan for the best use of this valuable resource.

The focus of the efforts of the Department of the Interior is directed to the maintenance of adequate national water supplies and adequate water quality for whatever uses man may wish to make of this resource. The Interior Department approach emphasizes the coordination and interrelation between uses, and the effect of these uses on management and the quality of the total water supply system.

Maintenance of water quality involves not only the quality levels for human consumption, but also quality levels for consumption by other animal and plant life, for development of other natural resources, and for industrial processes. These quality considerations are interrelated. They can be understood and controlled best from the point of view of water as a resource, rather than from the point of view of a particular quality need.

All waters in rivers, lakes, bays and estuaries should be as clean as possible, not as unclean as admissible. In handling water problems over a period of years, the Department has accumulated a great deal of experience. It has the facilities and the qualified manpower to deal with a wide variety of water problems. The broad interests of

the Department in water quality and related problems in the New Jersey coastal area and the adjacent estuary are reflected in the Department's agencies, which include the Water Pollution Control Administration. While each of these agencies has its own program, the Department exercises the administration necessary to assure that all programs are coordinated to achieve the best overall results.

Interior Bureaus, in addition to the Water Pollution Control Administration, carry on water quality studies related to the physical, chemical, and biological adequacy of our water resources. These studies and the associated research are chiefly those in which the skills and required knowledge are based on geology, chemistry, hydrology, engineering, and other physical science aspects of water management. Interior's water quality research extends beyond water supply to the study of environments adequate for the propagation, production, and control of both fish and wildlife resources, and for water-based recreation.

In common with many others, the Department of the Interior has interests and responsibilities in the economic and social aspects of water quality management. We recognize that such factors as quantitative requirements, competitive uses, and marketability of water and associated products must be given consideration in all plans. Interior

takes account of the economic impact and other values that protection of water quality will have on the communities, the basin, the State and the Nation.

In conclusion, we urge that steps be taken to eliminate from the New Jersey Coastal Area those domestic, agricultural and industrial pollutants which detract from the full public enjoyment of the aquatic resources of this area.

The Bureau of Sport Fisheries and Wildlife and the Bureau of Commercial Fisheries, which make up the Fish and Wildlife Service in the Department, have coordinated their activities and reports for this conference. A combined statement for the Fish and Wildlife Service will be made by Mr. Arthur S. Merrill, the Assistant Director of the Bureau of Commercial Fisheries Laboratory at Oxford, Maryland.

Thank you.

MR. STEIN: Thank you, Mr. Abelson, for a very excellent statement.

Are there any questions?

MR. KLASHMAN: I have no questions.

DR. KANDLE: No.

MR. STEIN: Thank you very much.

MR. KLASHMAN: Thank you, Mark.

I should now like to call on Mr. Arthur S. Merrill, Assistant Laboratory Director of the Bureau of

Commercial Fisheries, Biological Laboratory at Oxford, Maryland, who will talk for both the Bureau of Sports Fisheries and Wildlife and the Bureau of Commercial Fisheries.

Mr. Merrill.

STATEMENT OF ARTHUR S. MERRILL, ASSISTANT
LABORATORY DIRECTOR, BUREAU OF COMMERCIAL
FISHERIES, BIOLOGICAL LABORATORY, OXFORD,
MARYLAND

MR. MERRILL: Mr. Stein, Conferees, Ladies and
Gentlemen:

The U. S. Fish and Wildlife Service is made up of the Bureau of Sport Fisheries and Wildlife and the Bureau of Commercial Fisheries. Both Bureaus coordinate their reports on water quality standards and other reports dealing with shellfish and wildlife resources. The two Bureaus, in cooperation with the Division of Fisheries, Department of Conservation and Economic Development, Trenton, New Jersey, agree on the following statement. This statement defines the shellfish resources of the intracoastal waterway and the offshore continental shelf of the State of New Jersey so that the problems of pollution and other habitat destruction can be more easily related to these natural resources.

This report deals only with the distribution of molluscan shellfish. However, these shellfish are only a part of the fish and wildlife resources. For instance, blue crabs for a significant resource, but are not noted due to the wide general distribution of the species and lack of definite concentration areas. Fish and waterfowl distribution is not given. More information is needed on fish spawning and nursery areas and major concentrations and feeding areas for waterfowl. These data should include bottoms producing eelgrass and the important waterfowl marshes.

The significant shellfish resources in the intra-coastal waterway between Sandy Hook and Cape May Canal are hard clams, blue crabs, oysters, soft clams, and bay scallops. In cooperation with qualified field inspectors from the New Jersey Division of Shell Fisheries, the location of areas producing significant crops of hard clams, soft clams, and bay scallops were recorded on U. S. Coast and Geodetic Survey charts (plates I, II, III, IV, and V). All oyster seed bed areas which have produced seed oysters in the recent past were also located and are included on the same charts. Significance was generally based on existing resource but potential productivity was also considered.

Areas containing hard clams have been divided into three distinct groups as follows:

High Value - Areas producing an annual supply of

hard clams capable of supporting a sustained commercial shell fishery.

Moderate Value - Areas which produce commercial quantities of clams periodically but not on a sustained annual basis.

Low Value - Consistent but poor clam production, not of a density sufficient for commercial clamming. Primarily of value for recreational clamming.

Many factors influence the distribution of these shellfish resources. Of the four types of bottom -- (1) sand, (2) sand and mud (sticky), (3) shell or gravel bed, and (4) black mud, only the latter is considered to be unproductive for shellfish; loose sand, however, is poor bottom for oyster production.

Other factors, such as sunlight, which influences microscopic plant production, water temperature, and water evaporation; rainfall, which affects salinity and water exchange; winds, which affect the movement of water within the bays, between the bays and tributaries, and through the various inlets; all have an influence on the distribution of shellfish resources in the bay areas. Also, it is not uncommon for the bottom to change from one type to another due to man-made causes or severe storms. However, we conclude that within the limits of present knowledge these maps

(Plates I, II, III, IV, and V) provide an accurate description of the shellfish resources within that section of coastal New Jersey between the base of Sandy Hook and Cape May Canal.

The above reach contains approximately 127,000 acres of estuarine bays, sounds, and channels. This figure includes the lower portions of the major tidal streams as shown on the maps. Based on these data, over 80 percent of the tidal bottoms produce one or more species of shellfish in sufficient abundance to provide at least some recreational value. About 65 percent of these beds produce commercial quantities of shellfish. In some instances, the same bottom may contain two species of shellfish.

Hard clams are by far the most abundant and widespread shellfish species. Hard clams are found in commercial abundance in about 58 percent of the waters. This species will thrive in most bottom conditions except loose sand and black mud. Water depth does not appear to be a limiting factor in areas adjacent to the waterway. Hard clam production is generally stable throughout the area and can provide a substantial and increased contribution to the economy of coastal New Jersey. It is believed that the lack of hard clams in upper Barnegat Bay is a result of low salinity and poor water circulation.

It is important that the oyster seed areas be preserved and protected from the effects of any channel dredging program. Oyster seed beds are a highly specialized and valuable habitat consisting of shell or rock bottom (cultch) in areas where water conditions are suitable for the attachment and growth of oyster spat. Water currents must be such that the pelagic spat or larval oysters will be transported to areas where they can set on exposed rock or shell. Oysters will grow to maturity on these natural beds or may be transplanted to specially prepared grounds where they mature more rapidly to marketable size. Many of the areas designated as oyster seed beds on the attached plates are not producing oysters at the present time due to a number of factors including pollution, absence of cultch, predation or lack of spawning adults. There have been increased settings and survival in the past years emphasizing the importance of preserving these oyster seed areas.

Bay scallops are found in eelgrass or other beds of aquatic vegetation. This type of habitat is extremely valuable in that it not only produces shellfish but also an abundance of good waterfowl foods and is an excellent fish nursery area.

Soft clam beds are not widespread within the project area. However, when conditions are favorable, large

quantities of soft clams can be harvested from a relatively small area. This fact, coupled with a good demand for soft clams, makes this habitat extremely valuable.

In recent years, surf clams have become New Jersey's most valuable seafood resource. Abundant supplies occur in offshore New Jersey waters from near the shore line to depths of 25 fathoms. Populations of particularly high densities are being fished regularly in the areas of Barnegat Lightship and Cape May. These areas are shown in black on Plate VI. In 1966 over 42 million pounds of surf clams were fished from a relatively small area of the ocean bottom off Barnegat Lightship. Of greater economic interest is the landed value of the surf clam harvest. Commercial landings had a dockside value of 3.7 million dollars in 1966, which makes surf clams the most valuable New Jersey seafood product. Other important New Jersey seafood resources are: menhaden, valued at 1.3 million dollars; sea scallops, 1.1 million dollars; and hard clams, 0.9 million dollars.

Sea scallops are found in the moderately deep waters off New Jersey in depths of 25 to 40 fathoms. However, definite concentration areas are hard to define because of uncertain setting in any given area. Dense concentrations of mahogany quahogs also occur in these deeper waters from 20 to 80 fathoms. Although this resource is not being utilized at

present, the potential need for this shellfish in the future is great.

The two Bureaus of the U. S. Fish and Wildlife Service and the New Jersey Division of Fisheries agree in the interest of the shellfish resources that it is necessary to clean up the sources of existing pollution, and resist future pollution in New Jersey waters. We must also beware of cleaning up inland waters at the expense of polluting the ocean waters offshore where large surf clam resources and other shellfish are known to exist.

MR. STEIN: Thank you, Mr. Merrill.

These plates are very valuable and I am going to try to put them in the record.

MR. MERRILL: Thank you.

MR. STEIN: If we can, we will insert them in the record. If we cannot, we will put them in as an exhibit. If these do not appear, the only reason they won't appear is not because we have not made an effort, but that the price will be so high. We will make these available at our regional office and at our office.

MR. MERRILL: I was thinking of trying to reduce them down to page size. However, by doing that, it will show the area too small to make it significant.

MR. STEIN: This is the problem. If we can't

A. S. Merrill

do that, then we will have to see what the price of inserts will be, but we will work on that with you people and have our technical people work on that, and, hopefully, we will get these in the record, because I think these plates are very valuable.

MR. MERRILL: I have some copies of these, if they are of any use. If you want, I will forward them to you.

MR. KLASHMAN: Mr. Merrill, we would like to have additional copies, if you have them.

MR. MERRILL: It will be about two weeks.

MR. KLASHMAN: Fine.

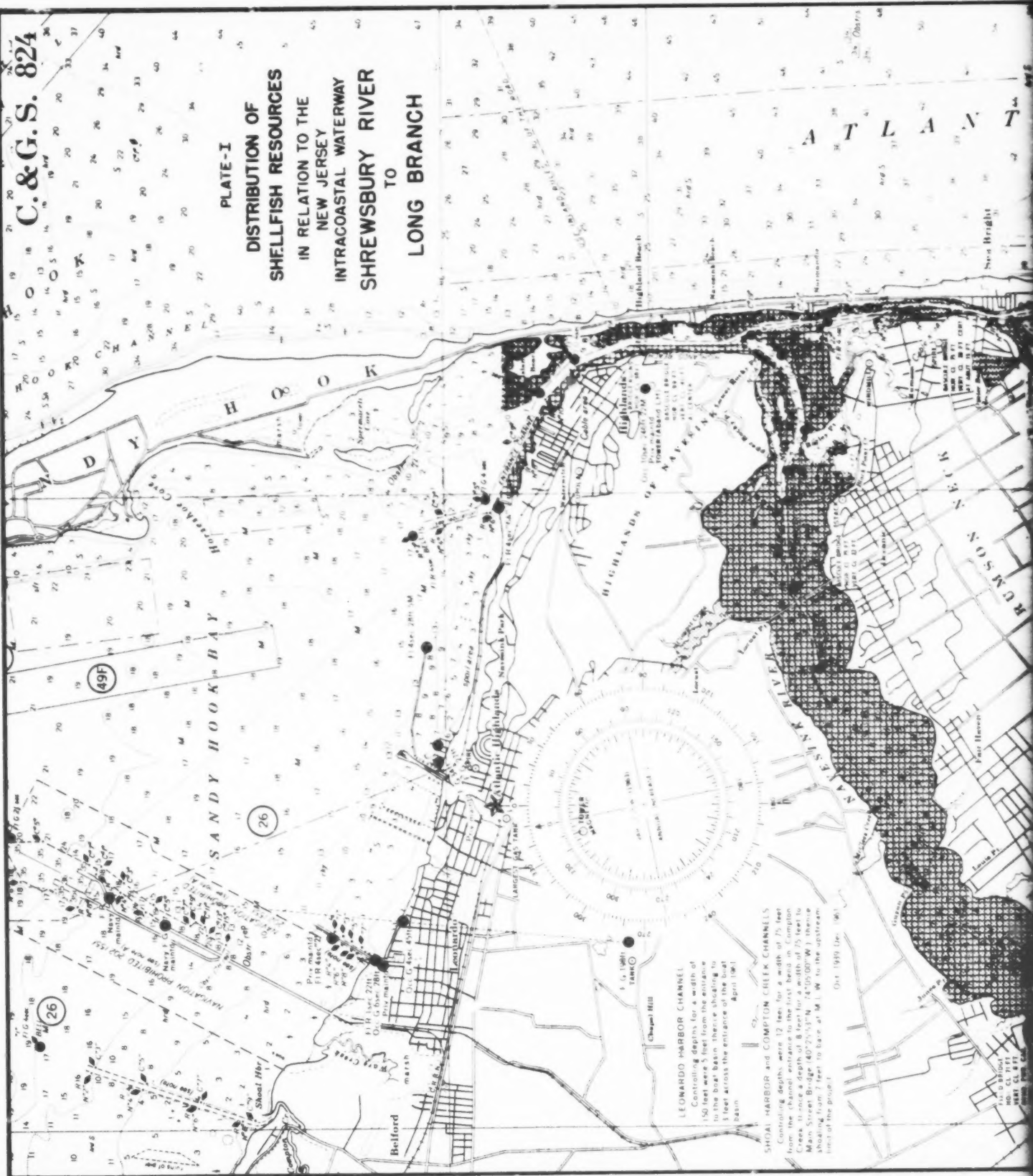
MR. MERRILL: Shall I send them to you?

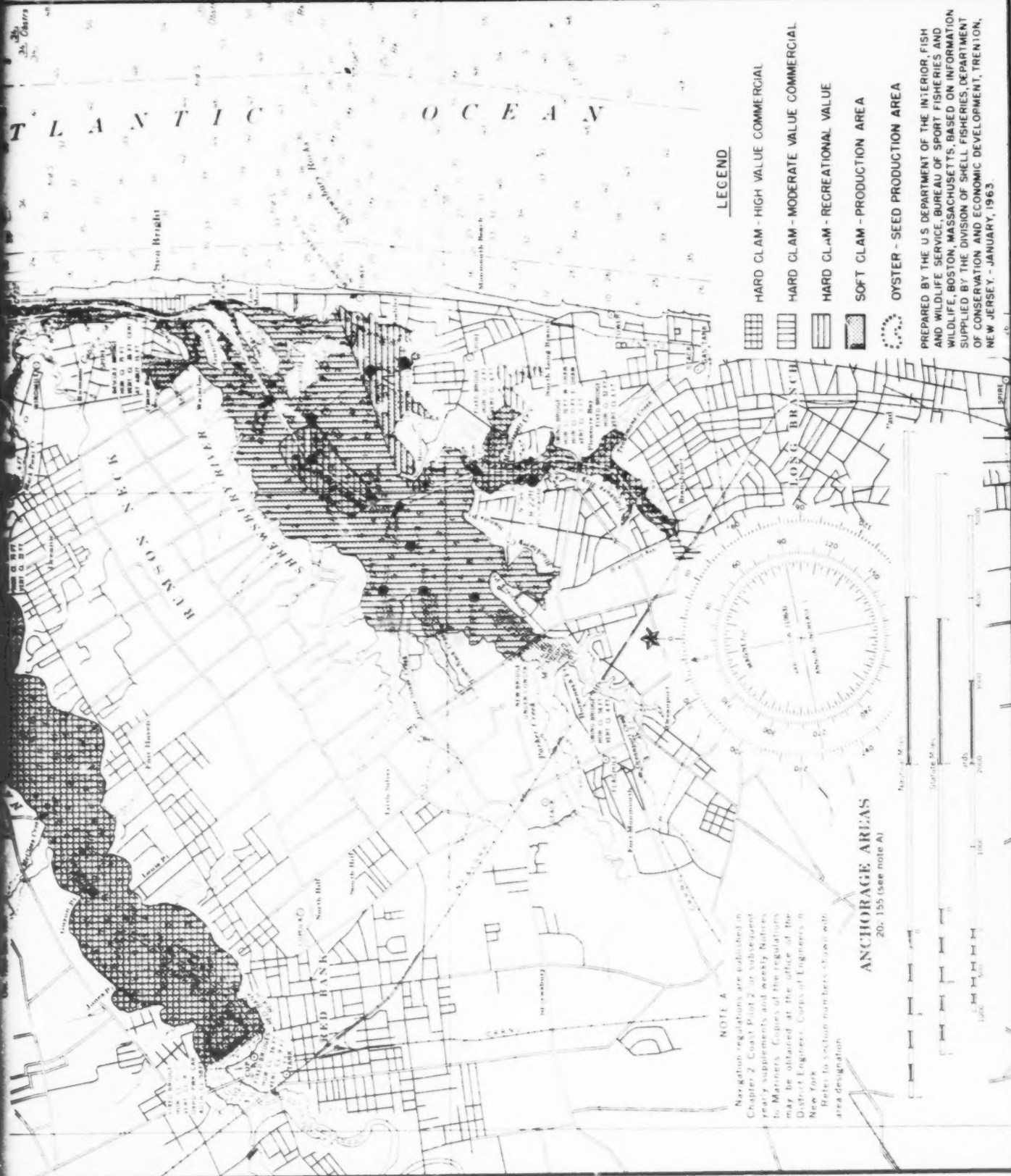
MR. KLASHMAN: Yes, please, or send them to Mr. Walker. He will give you the address.

MR. MERRILL: All right.

(The plates referred to are as follows:)

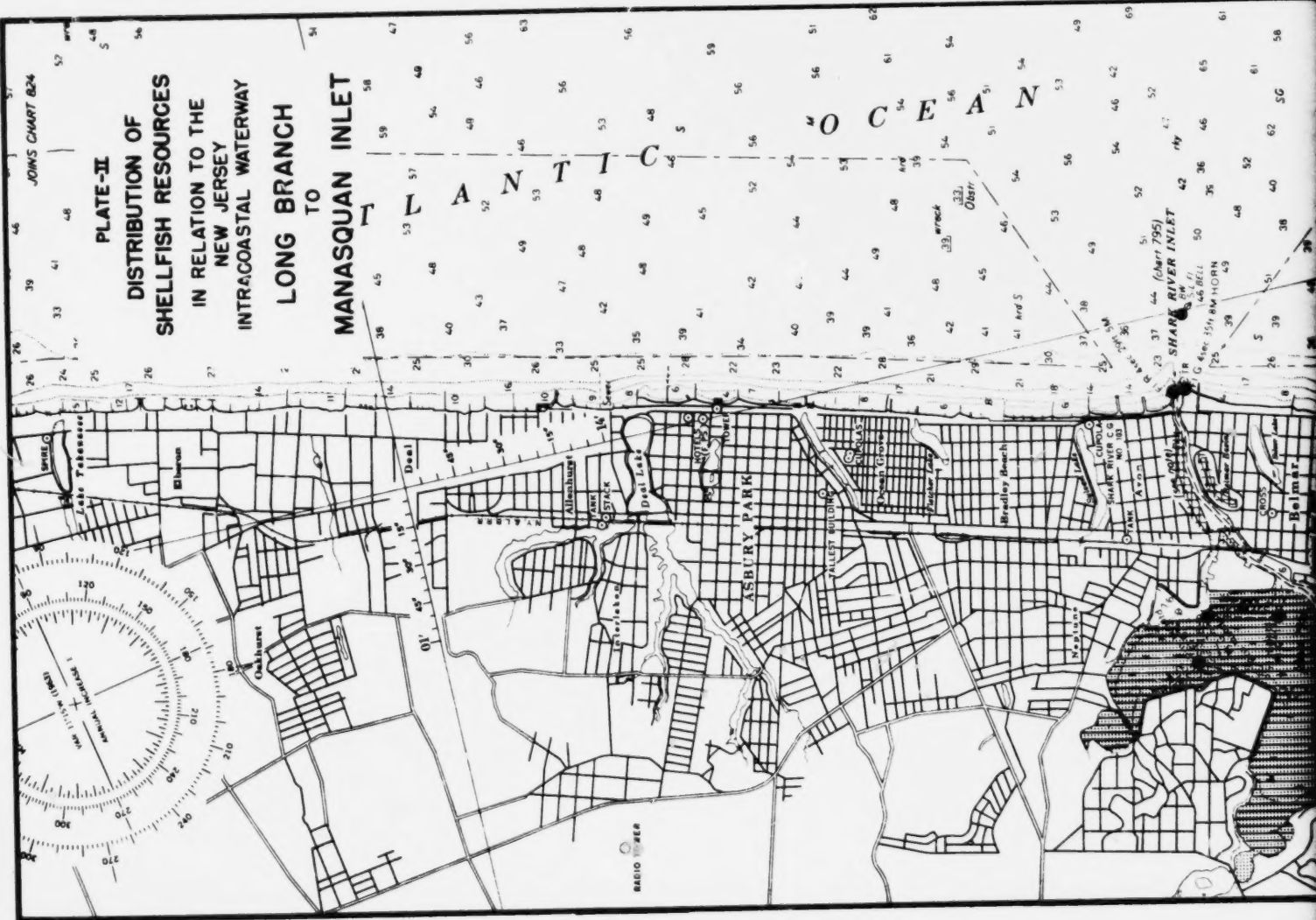
PLATE-I
DISTRIBUTION OF
SHELLFISH RESOURCES
IN RELATION TO THE
NEW JERSEY
INTRACOASTAL WATERWAY
SHREWSBURY RIVER
TO
LONG BRANCH





JOINS CHART B24

PLATE-II
DISTRIBUTION OF
SHELLFISH RESOURCES
IN RELATION TO THE
NEW JERSEY
INTRACOASTAL WATERWAY
LONG BRANCH
TO
MANASQUAN INLET



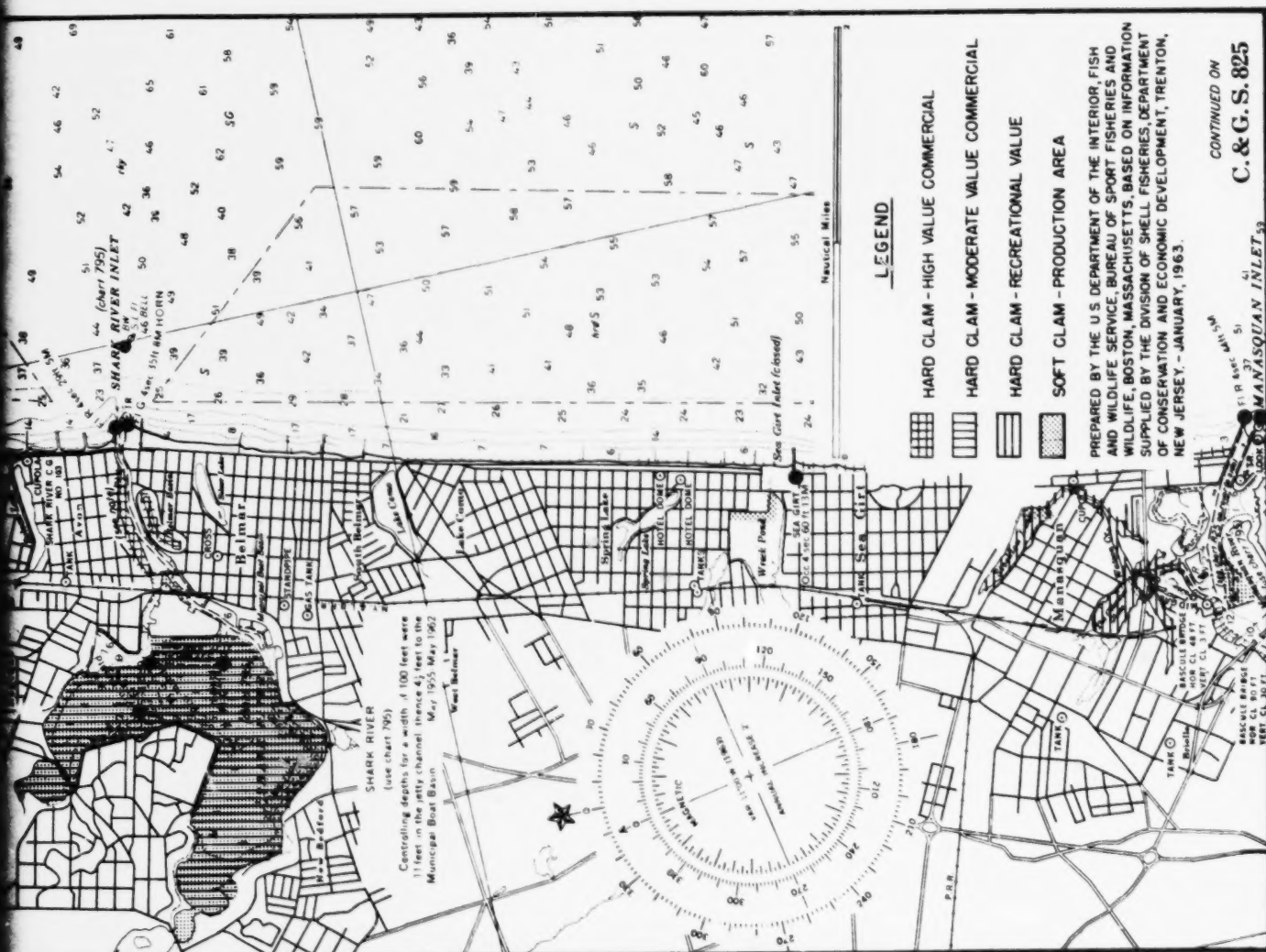
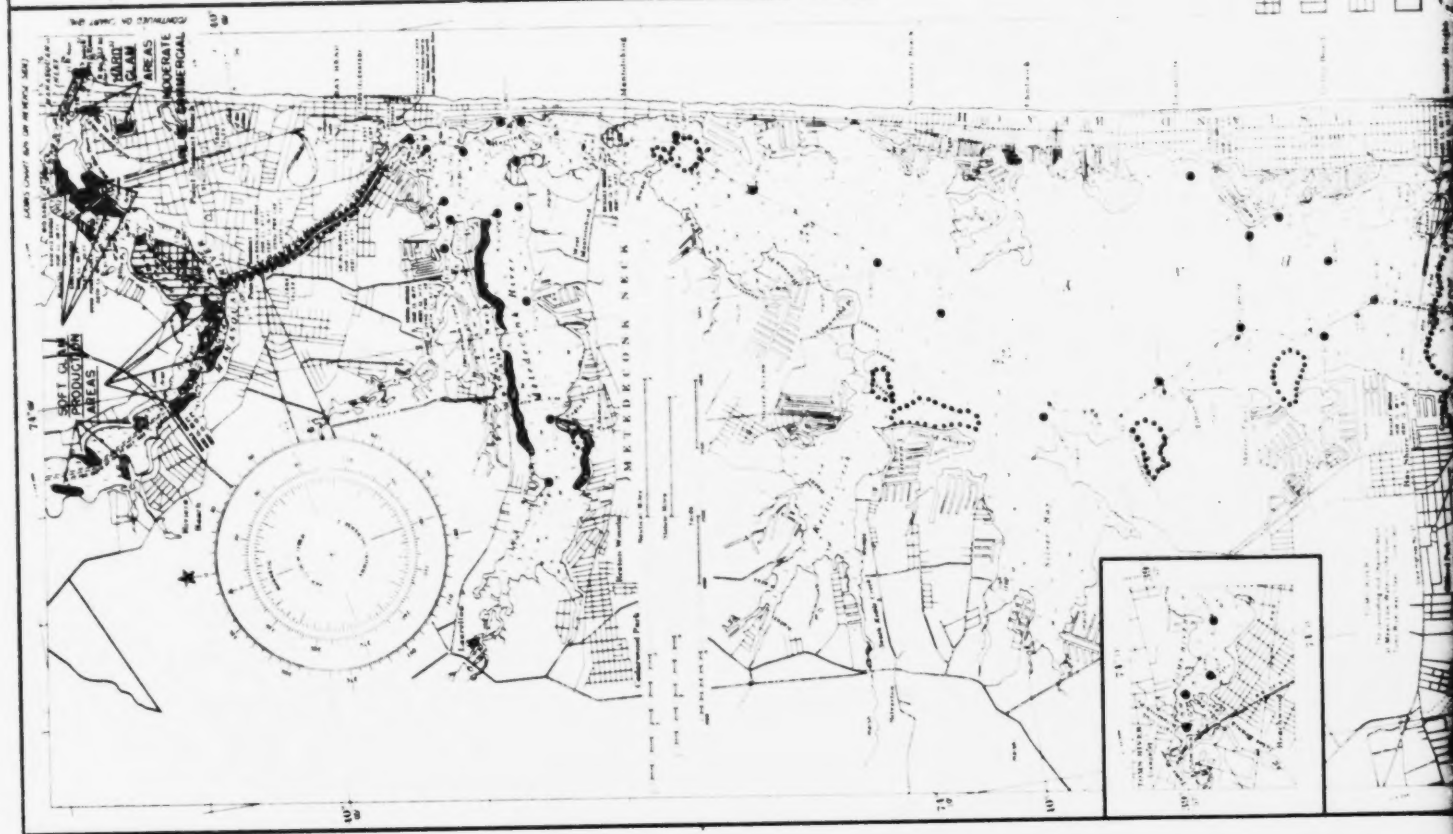
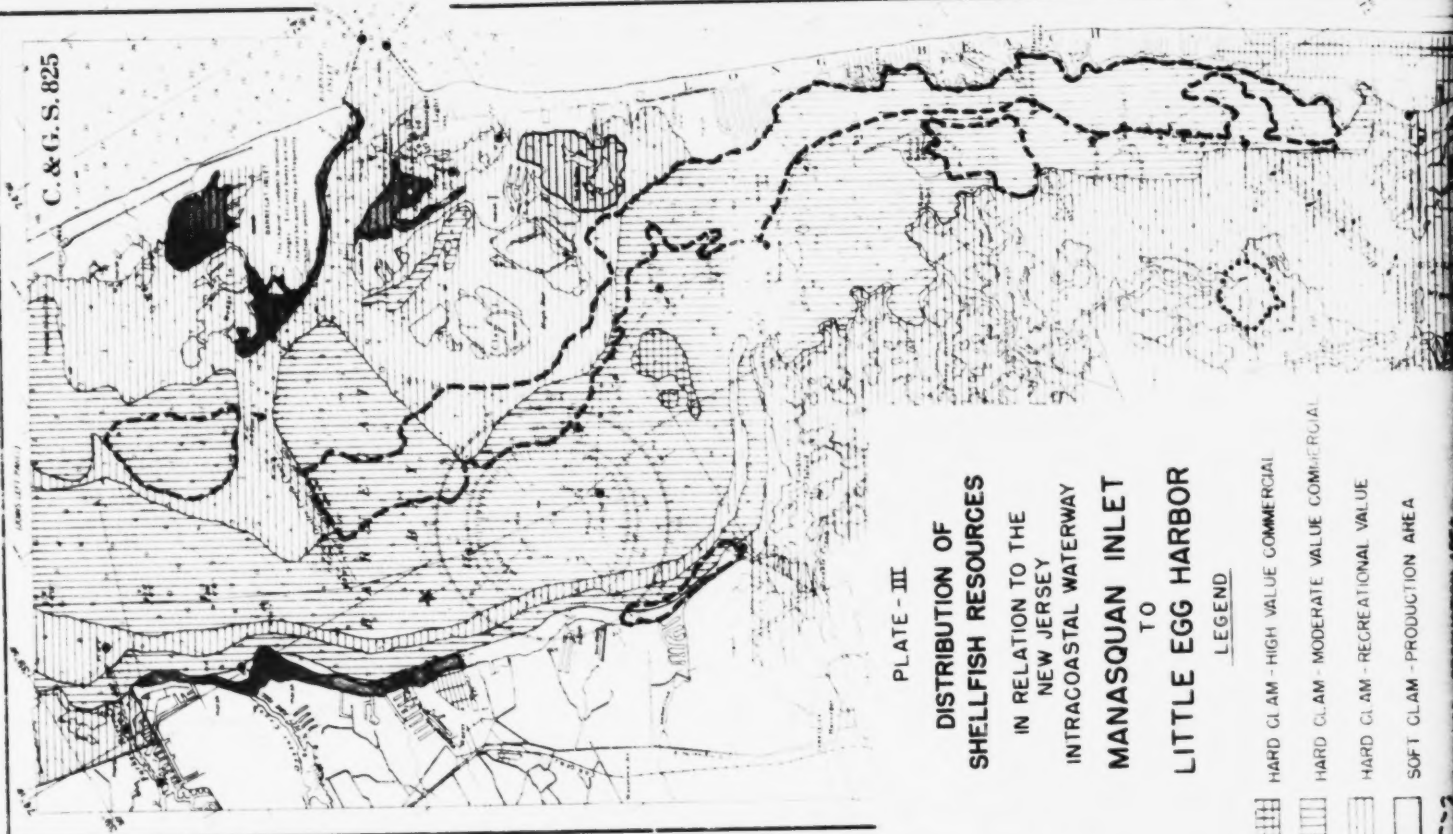


PLATE - III
DISTRIBUTION OF
SHELLFISH RESOURCES
IN RELATION TO THE
NEW JERSEY
INTRACOASTAL WATERWAY
MANASQUAN INLET
TO
LITTLE EGGS HARBOR

LEGEND

-  HARD CLAM - HIGH VALUE COMMERCIAL
-  HARD CLAM - MODERATE VALUE COMMERCIAL
-  HARD CLAM - RECREATIONAL VALUE
-  SOFT CLAM - PRODUCTION AREA

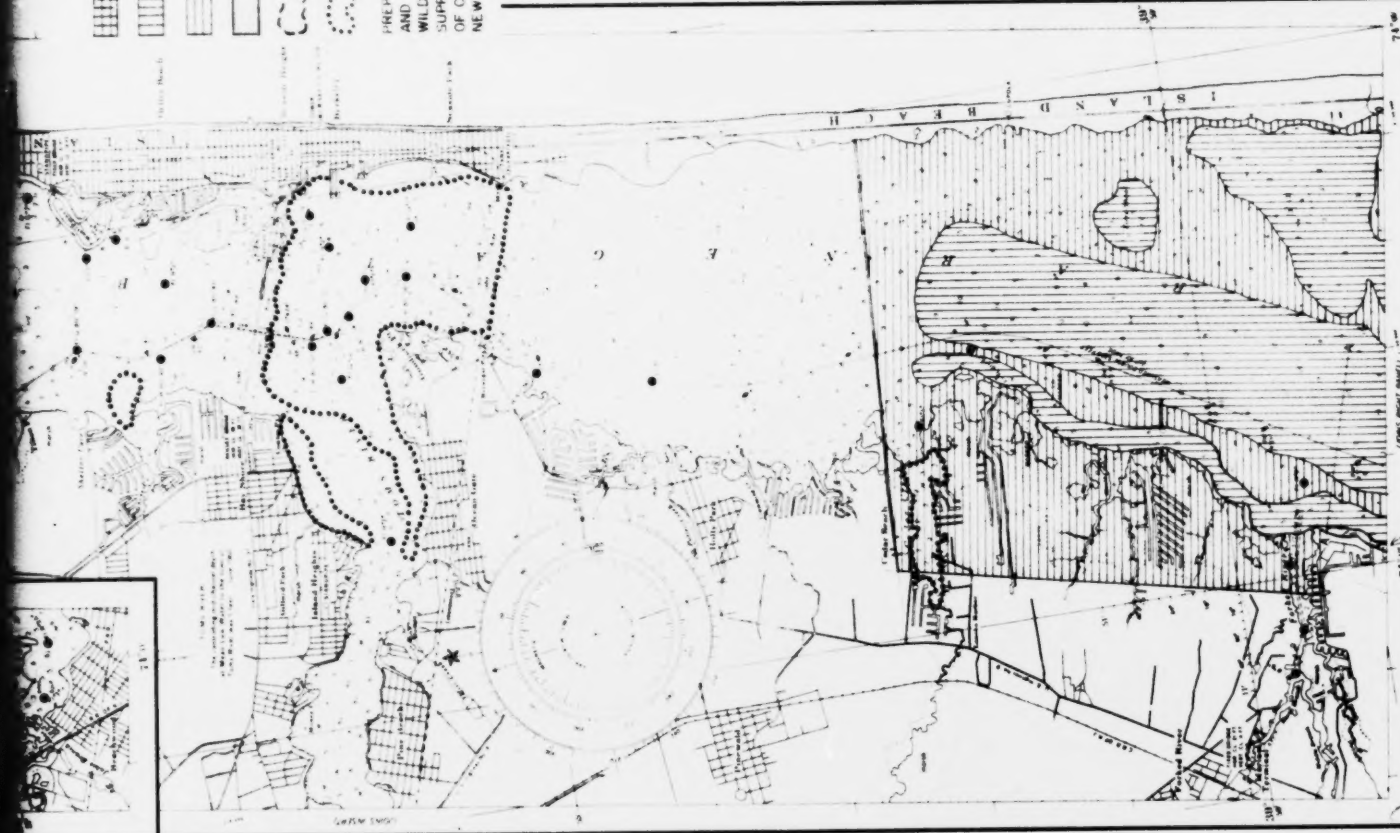
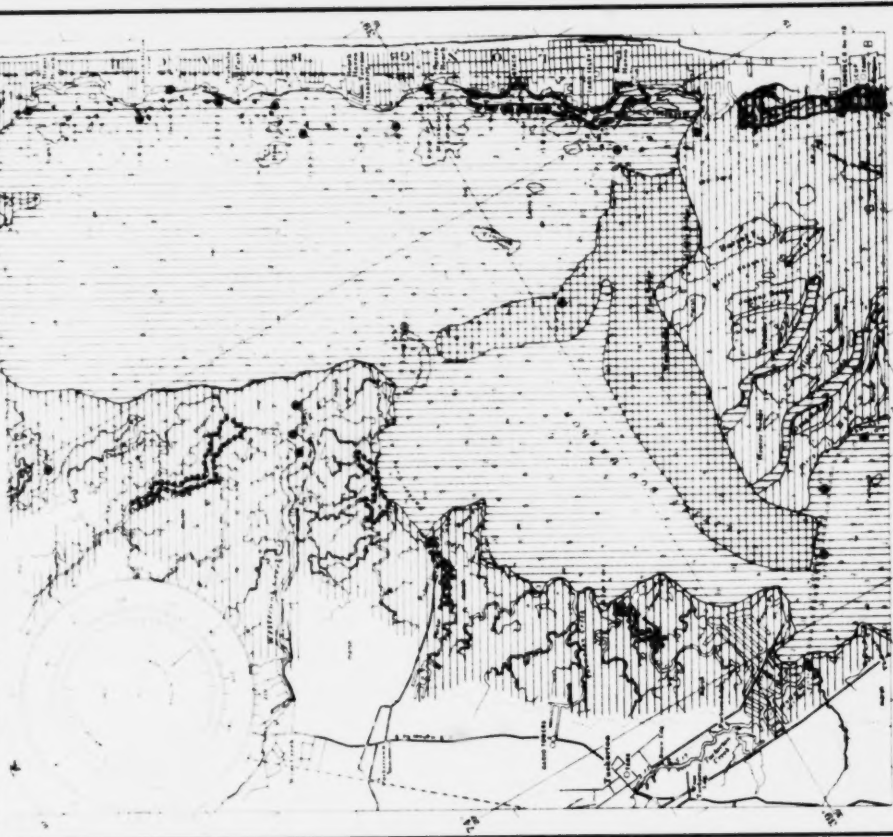


LITTLE EGGS HARBOR

LEGEND

-  HARD CLAM - HIGH VALUE COMMERCIAL
 HARD CLAM - MODERATE VALUE COMMERCIAL
 HARD CLAM - RECREATIONAL VALUE
 SOFT CLAM - PRODUCTION AREA
 SCALLOP - PRODUCTION AREA
 OYSTER - SEED PRODUCTION AREA

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 AND WILDLIFE SERVICE, BUREAU OF SPORT FISHERIES AND
 WILDLIFE, BOSTON, MASSACHUSETTS, BASED ON INFORMATION
 SUPPLIED BY THE DIVISION OF SHELL FISHERIES, DEPARTMENT
 OF CONSERVATION AND ECONOMIC DEVELOPMENT, TRENTON,
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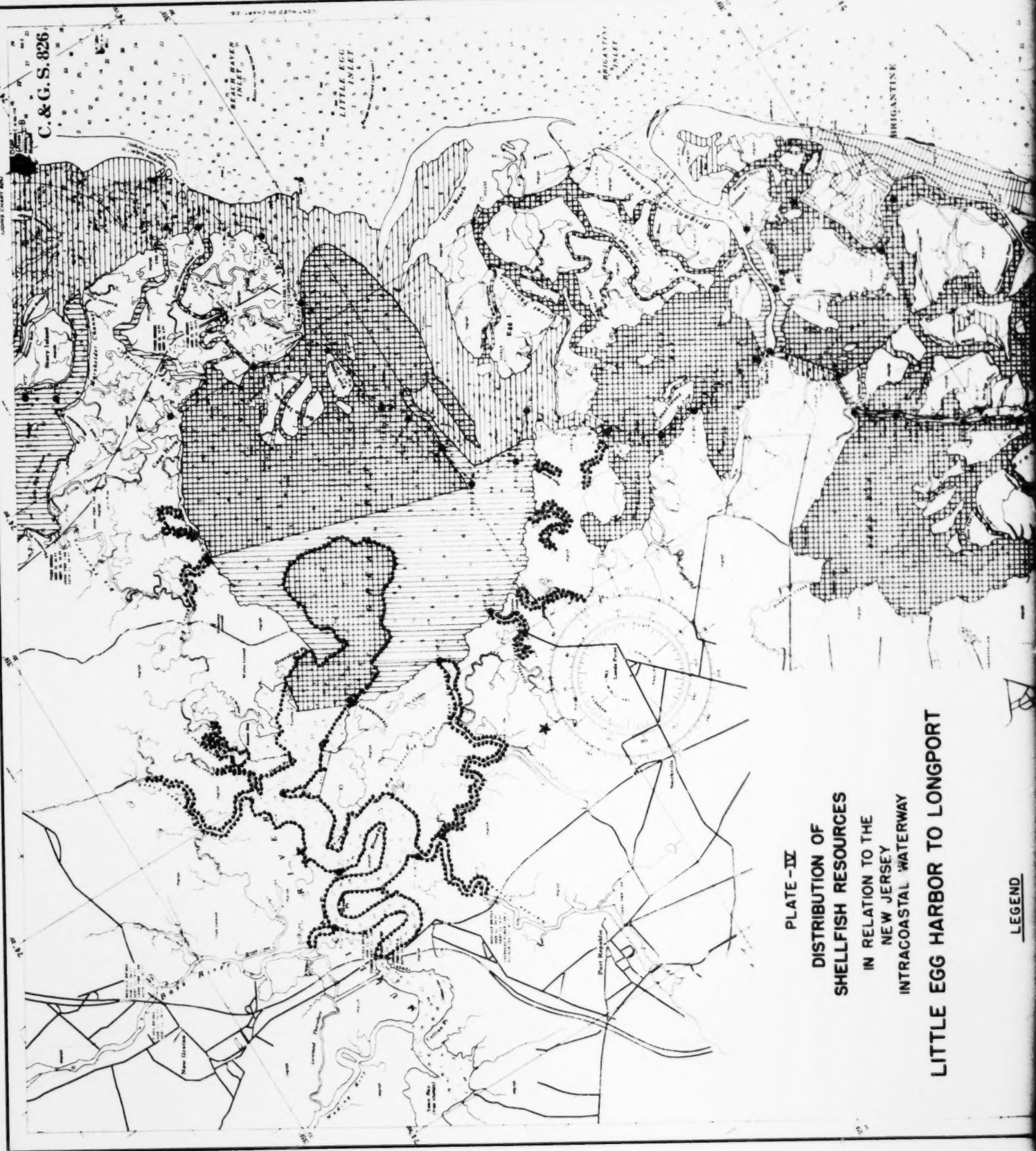


PLATE - IV
DISTRIBUTION OF
SHELLFISH RESOURCES
IN RELATION TO THE
NEW JERSEY
INTRACOASTAL WATERWAY
LITTLE EGG HARBOR TO LONGPORT

LEGEND

SHELLFISH RESOURCES
IN RELATION TO THE
NEW JERSEY
INTRACOASTAL WATERWAY
LITTLE EGG HARBOR TO LONGPORT

LEGEND

-  **HARD CLAM - HIGH VALUE COMMERCIAL**
-  **HARD CLAM - MODERATE VALUE COMMERCIAL**
-  **HARD CLAM - RECREATIONAL VALUE**
-  **SOFT CLAM - PRODUCTION AREA**
-  **OYSTER - SEED PRODUCTION AREA**

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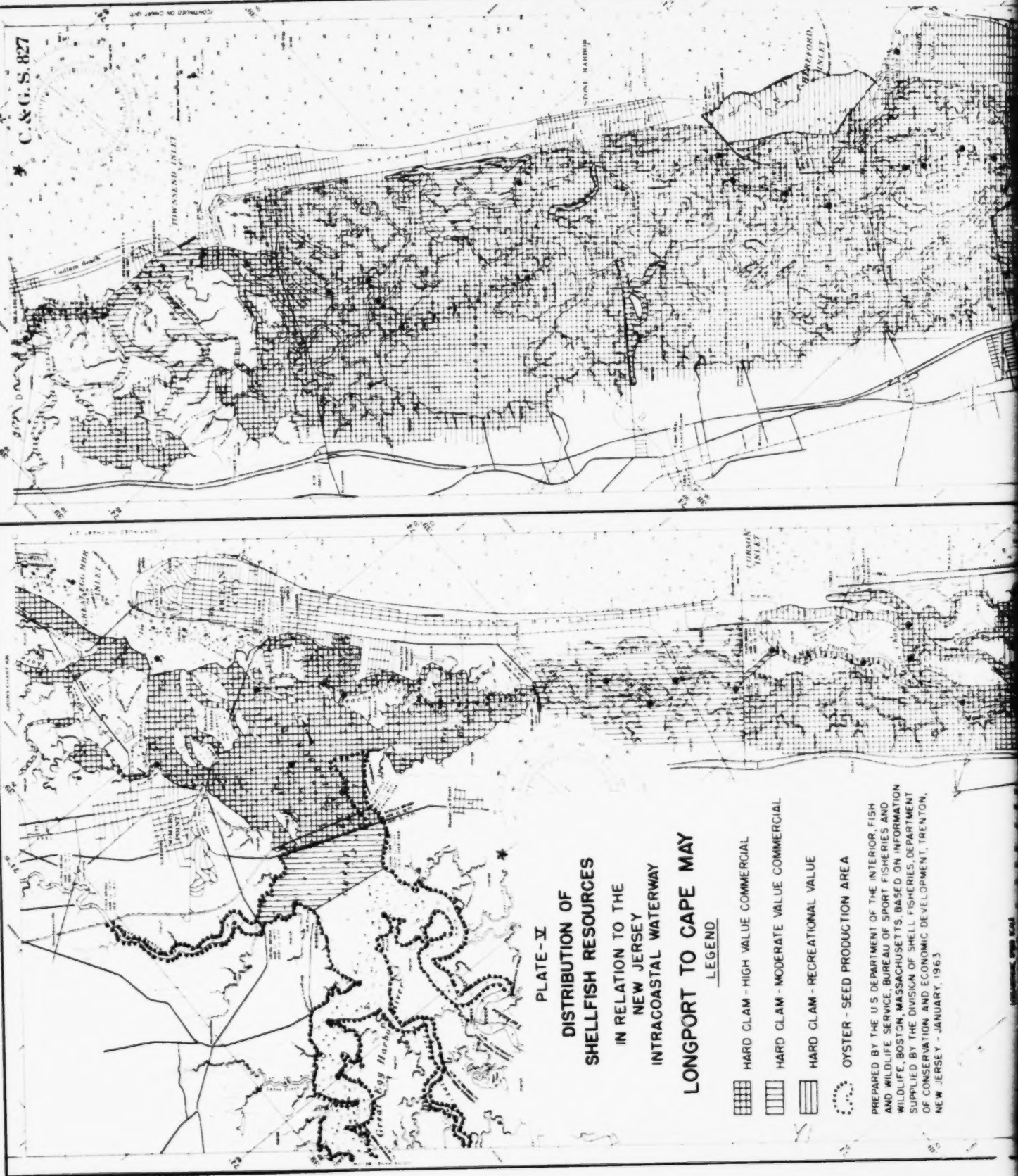
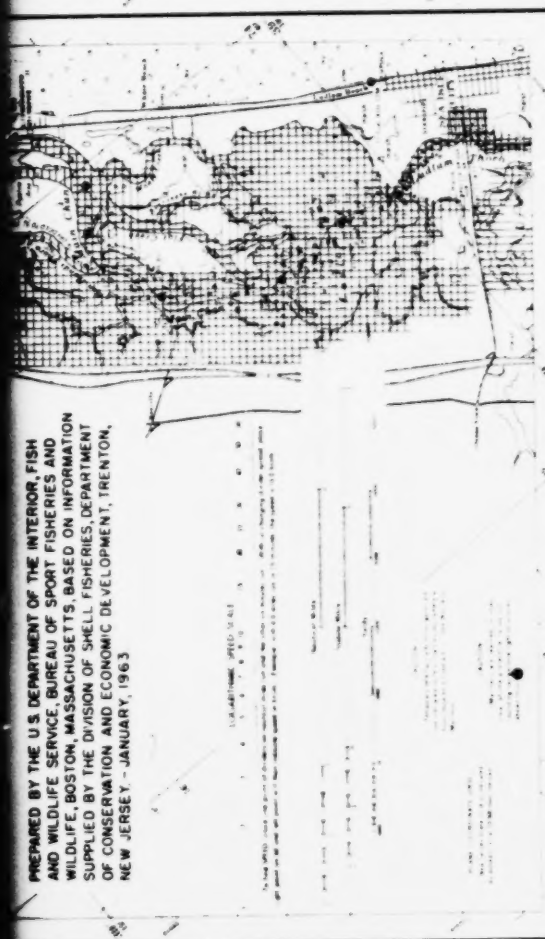


PLATE - V
DISTRIBUTION OF
SHELLFISH RESOURCES
IN RELATION TO THE
NEW JERSEY
INTRACOASTAL WATERWAY
LONGPORT TO CAPE MAY

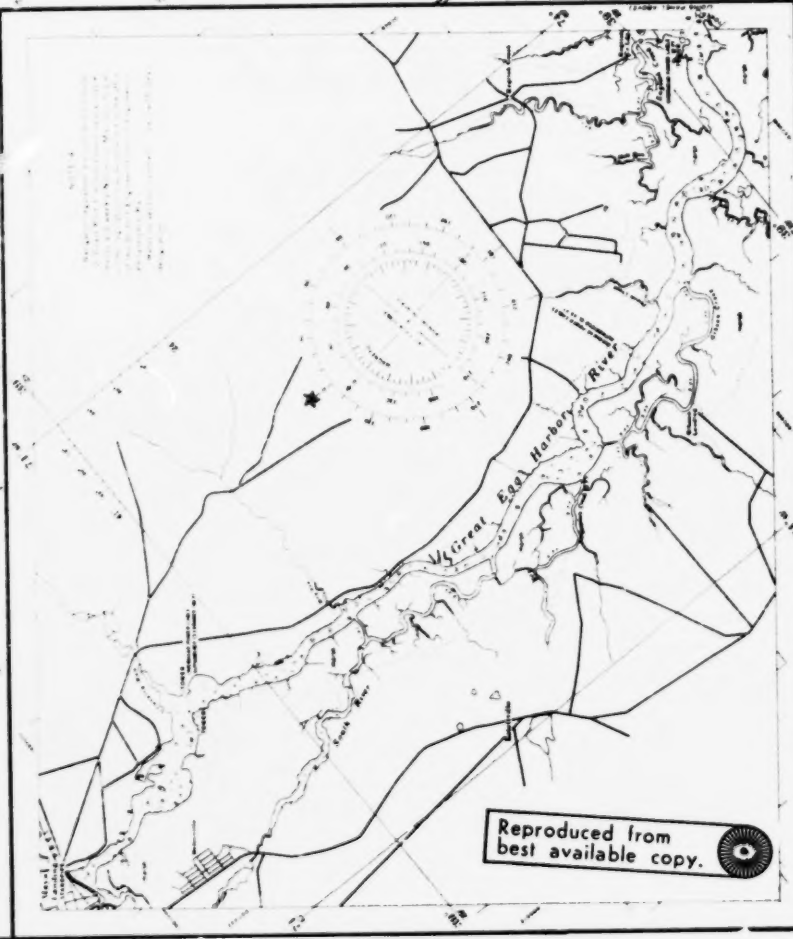
LEGEND

-  HARD CLAM - HIGH VALUE COMMERCIAL
-  HARD CLAM - MODERATE VALUE COMMERCIAL
-  HARD CLAM - RECREATIONAL VALUE
-  OYSTER - SEED PRODUCTION AREA

PREPARED BY THE U.S. DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE, BUREAU OF SPORT FISHERIES, AND WILDLIFE, BOSTON, MASSACHUSETTS, BASED ON INFORMATION SUPPLIED BY THE DIVISION OF SHELL FISHERIES, DEPARTMENT OF CONSERVATION AND ECONOMIC DEVELOPMENT, TRENTON, NEW JERSEY - JANUARY, 1963



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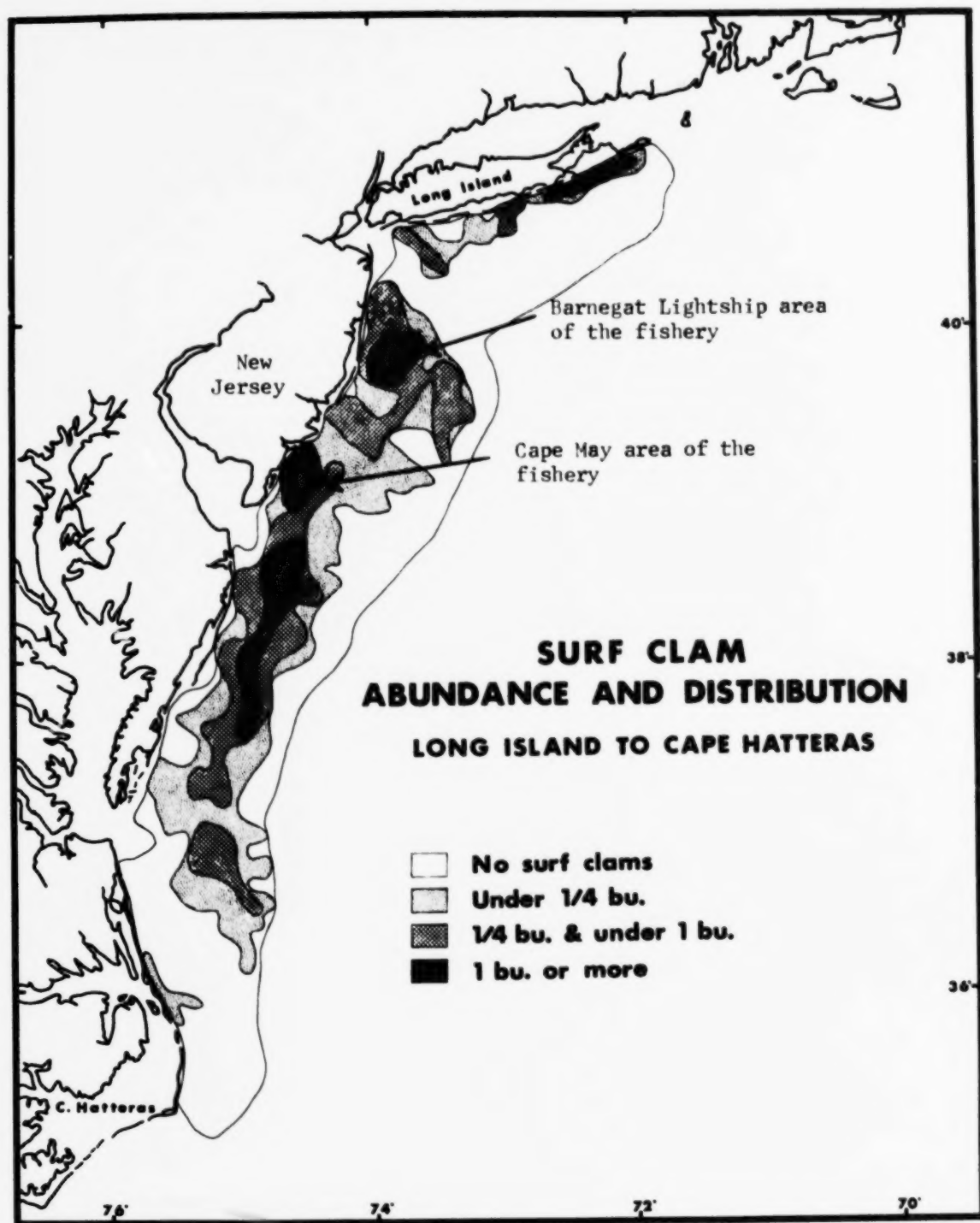


Plate VI. Abundance and distribution of surf clams - middle Atlantic.

A. S. Merrill

MR. KLASHMAN: Mr. Merrill, I wonder if you could comment on the damages which we have calculated in our report. Do you feel that the damages are greater or are we more or less in the ball park?

MR. MERRILL: I think practically all these areas, it seems to me, are closed off.

A. S. Merrill

MR. KLASHMAN: I am talking about the 33,000 acres that we have talked about in our report. We put down some figures of \$1.5 and \$3.2 million as a value for these.

Do you have anything else to contribute to that?

MR. MERRILL: I would say that it is very conservative. Four times the market value is probably conservative as to that.

MR. KLASHMAN: What do you think you would figure it as?

MR. MERRILL: Between five and ten.

MR. KLASHMAN: In other words, you think that it might be at least double the figures that we have shown here?

MR. MERRILL: I would say that would be closer to it.

MR. KLASHMAN: Thank you very much.

MR. STEIN: Dr. Kandle?

DR. KANDLE: I didn't understand your comments that you thought most of the areas were closed off, which obviously is not true. Most of the waters are open, as a matter of fact, even for hard clamming, so that is a gross misstatement.

MR. MERRILL: I meant the areas that you are talking about, the 33,000 acres are closed off.

DR. KANDLE: I see.

MR. MERRILL: I know we have shellfish that could be utilized there if it were not closed off.

DR. KANDLE: That is partly true.

MR. STEIN: I would like to pursue this question a little bit that you raise about the ocean resources, particularly with the surf clams.

We all recognize we have a rather difficult resource problem here, because we have all these areas closed in the bay areas and in the estuaries, and if we can open those, we don't want to do that at the expense of anything else. We do not want to move the problem somewhere else.

But, in looking at your surf clam operation, where does the harvesting of that take place, about how far offshore?

MR. MERRILL: I would say that it is maybe between 12 and 20 miles, somewhere in that area, offshore.

MR. STEIN: If we are dealing with an area 12 or 20 miles offshore, and I see two major areas on your Plate No. VI off the New Jersey coast, without prejudging this, and I think you have a point that every outfall has to be looked at with care, I don't know that we necessarily have to preclude, at least from scientific exploration, the notion that we might be able to collect and discharge these wastes at certain selected points in an ocean outfall, do you?

A. S. Merrill

MR. MERRILL: This is my personal viewpoint, but I am not sure that it is official in our Bureau yet --

MR. STEIN: Yes.

MR. MERRILL: We haven't done any work offshore except at one point off New York, in which that showed a radius of influence, and we feel until we know more about this that we should not commit ourselves, but we feel the dilution factor is much greater offshore.

MR. STEIN: I recognize that, but, you know, the problem that we are going to face here, as I see this, is that the effluent has to go somewhere.

MR. MERRILL: Yes.

MR. STEIN: The suggestion was made that we treat it so well that we might put it underground. Maybe we can do that; maybe not. The cost of that may be prohibitive.

Therefore, it would seem to me that we have a really difficult problem in resources development. I think the remarks of Mark Abelson were pertinent. If the Interior Department and our being here means anything, this is the problem that we have to work at. If we are going to discharge the effluent, we never are going to have the ideal choice.

Let's assume, for the moment, that we eliminate this underground aquifer operation. Of course, if we can do that, that is fine, but let's assume that we have to discharge

A. S. Merrill

effluents where we generally have been discharging them in the past in surface waters.

We have a choice of either discharging them where it would be most economical, and let the pollution control facilities develop naturally. In that case, we would probably not reclaim any of the shellfish area which is now closed off.

Or, we have the choice of collecting it and then discharging it into certain selected places in the estuaries, or the bays, or ocean outfalls, or a combination of the two.

What I am suggesting, on the basis of what you said about the surf clams, is that it does not seem to me that we have precluded the possibility of possibly having the least damaging effect of some of the effluent going into the ocean, rather than the bays and the estuaries.

MR. MERRILL: Right. This is being studied.

As I say, there is no scientific work or basis for this, and we are only assuming.

MR. STEIN: Right.

MR. MERRILL: But I would like to point out that you are looking at a chart of surf clam distribution and density as of 1965. In 1975 it might change altogether. There might be areas of poor densities, and, all of a sudden, we have maturing and success in the area, and so

they move.

We are not restricted to these places forever.
It is just right now.

MR. STEIN: Yes, but has there ever really been commercial harvesting of surf clams real close to shore?

You see, here is what I am getting at: The notion that you are going to build an outfall ten, twelve or twenty-five miles out is not very likely. If you are going to have an ocean outfall, it is going to be within the ranges they put here of several thousand feet offshore.

Now, if the range of commercial development of surf clams is in terms of miles rather than thousands of yards, we may be in different zones and we may have a productive area that we can look at to solve the problem.

MR. MERRILL: We have a situation that prevails right now in this area. We have what are called the inshore and the offshore.

In the winter months, when the weather is not too good, we are willing to take clams which may be slightly smaller in size, but closer in to shore, where the boats can pick them up quickly and bring them in.

How far would you say that would be offshore?

MR. KLEB: That would be very close to the beach.

MR. MERRILL: That is right.

MR. KLEB: Possibly half a mile from the beach.

MR. MERRILL: It is almost onshore in this case, and in this particular case right now, it is off Cape May, but it could be in other areas.

MR. STEIN: Right. Thank you.

Are there any other questions?

DR. KANDLE: I don't have a question, but I want to emphasize the point that Mr. Merrill made. In fact, I thought his whole presentation was very good, but he made the special point that each of these problems has got to be looked at individually, so there is no generalizing in this field.

Secondly, Mr. Chairman, I think we are all extremely cognizant that in every single change we make, we disturb the ecology, as Mr. Merrill and others have been talking about.

The other point, which I think is very important that we don't know very much about yet, is that all shellfish are not necessarily under health regulation, as, for example, scallops, so we are not saying what has to be under regulation or what kind of regulation.

MR. STEIN: Dr. Kandle, I certainly agree with what you say. This comment is very true. Any change that you make is going to disturb the ecology, but, in a way, it

is like the monetary system. If you don't do something, you have taken an action right now. I think the reason we are here is because what we are doing now, or what is suggested for the future, would disturb the ecology. Otherwise, all those thousands of acres wouldn't be off limits.

The question here is how we can manage the resource, doing the minimum amount of damage and getting the maximum value from the water resource.

In our problem here, we are really faced with a Hobson's choice. If we are going to put this effluent somewhere, we are going to disturb the ecology, but the problem is that we have to put it somewhere, and how we can most adroitly place this is the question to which we have to address ourselves.

MR. MERRILL: I can give you a personal example.

MR. STEIN: Yes.

MR. MERRILL: We are dealing in one part of New Jersey from the Delaware River going into the Delaware Bay, and up in the Delaware River section there is untold pollution. There are millions and millions of gallons of not only ordinary raw pollution, but chemical as well, going into those waters, and they have to get themselves down to the bay and be flushed out into the open water, and so eventually the water is being diluted more greatly in the

ocean waters, but down in the lower bay there are a lot of shellfish resources which are not polluted, and this material is diluted out greatly as it makes its way in tidal recedes generally through the bay.

So, in this respect, the offshore question, I would say, is a thousandfold greater, and the chances of polluting these areas are much less than they are in the in-shore estuarine waters.

MR. STEIN: Thank you very much, Mr. Merrill.

Are there any other comments or questions?

(No response.)

MR. STEIN: If not, Mr. Klashman?

MR. KLASHMAN: Are there any other representatives from the Department of the Interior who wish to make a statement?

(No response.)

MR. KLASHMAN: If not, I should now like to call on Mr. Ralph Van Derwerker, who is Regional Consultant for the Environmental Engineering and Food Protection Programs in the United States Public Health Service, Department of Health, Education, and Welfare.

Mr. Van Derwerker.

R. J. Van Derwerker

STATEMENT OF RALPH J. VAN DERWERKER,
REGIONAL REPRESENTATIVE, NATIONAL
CENTER FOR URBAN AND INDUSTRIAL HEALTH,
PUBLIC HEALTH SERVICE, UNITED STATES
DEPARTMENT OF HEALTH, EDUCATION, AND
WELFARE, REGION II, NEW YORK, NEW YORK

MR. VAN DERWERKER: My name is Ralph J. Van Derwerker. I am a registered professional engineer in New Jersey and Regional Representative, National Center for Urban and Industrial Health, Public Health Service, U. S. Department of Health, Education, and Welfare, Region II, New York, New York. This statement is being made on the behalf of the Department of Health, Education, and Welfare at the invitation of the Department of the Interior in response to their letter of October 12, 1967. Another, and perhaps more significant reason for my presence is that the Department of Health, Education, and Welfare, under the Public Health Service Act, as amended, is responsible for the protection of the public health in general, and specifically for preventing the spread of communicable disease from one State to another.

R. J. Van Derwerker

Our interest in this conference relates to the health aspects of water pollution in the geographic area considered, particularly, health aspects relating to the uses of shellfish harvesting, water contact recreation, and public water supply.

Shellfish Harvesting

The conference report prepared by the Federal Water Pollution Control Administration adequately covers shellfish sanitation aspects of water pollution. We were grateful for the opportunity to review and comment upon an earlier draft of that report -- in accordance with the Interdepartmental Agreement Concerning Consultation Between the Departments of Health, Education, and Welfare, and Interior, signed on September 1, 1966. Our regional office comments were submitted to the Federal Water Pollution Control Administration by letter on March 14, 1967.

The National Shellfish Sanitation Program is based upon the premise of a continuing safe and beneficial use of shellfish as a natural resource. The program is a voluntary cooperative effort comprising the Public Health Service, the participating States including New Jersey, and the shellfish industry. The estuarine areas of Eastern New Jersey support a valuable shellfish resource which must be protected.

R. J. Van Derwerker

Maintenance of acceptable sanitary water quality over these shellfish beds is of paramount importance in the ability of the shellfish to survive and reproduce and to the growth of a safe product for direct marketing as a food.

Oysters, clams and mussels have an unusual potential for the transmission of disease to man. This unusual potential can be attributed to three factors: (1) The environmental growth tolerance of shellfish is such that they ordinarily grow only in estuaries in which there is an admixture of fresh and salt water. However, the estuarine waters of Eastern New Jersey are receiving waters for waste discharges from municipal and domestic sewerage systems, industrial operations and extensive commercial and recreational water craft traffic. (2) Shellfish are filter feeders. In the process of feeding, they pump large quantities of water across their gill systems. Particulate material and dissolved substances are removed and concentrated to levels above that of the overlying water. The Northern Quahog (Hard Clam - Mercenaria mercenaria), the shellfish species in most abundance in Eastern New Jersey, during periods of active feeding, can concentrate bacteria to a level of 2.5 to 6.0 times that of the overlying waters. The concentration factor for metals, radionuclides, industrial wastes and pesticides is much greater. For example, it has been

R. J. Van Derwerker

reported that the Eastern oyster has a concentration factor of 17,000 for Zn^{65} . (3) Shellfish are frequently consumed raw or with little cooking. The entire animal is eaten.

It has been demonstrated many times that these factors can combine to transmit human illness. A positive relationship, therefore, exists between pollution of shellfish-growing areas and infectious disease and poisoning from high metal concentrations. Typhoid fever has been historically linked with polluted shellfish and in recent years there has been evidence of possible transmission of infectious hepatitis by raw shellfish. The possibility also exists for the transmission of other enteric virus infections by contaminated shellfish.

For a shellfish-growing area to be approved for the harvesting of shellfish, the classification must be supported by a comprehensive sanitary survey which presents evidence that pathogenic microorganisms, radionuclides and/or harmful industrial wastes do not reach the area in dangerous concentrations. As a measure of the relative safety of an area, the median coliform MPN of the water must not exceed 70 per 100 ml, and a percentage of the samples taken must not exceed an established count depending on the dilution techniques used. The water sampling must obviously be made of the waters in the area most probably exposed to

R. J. Van Derwerker

contamination during the most unfavorable hydrographic and pollution conditions.

Considerable information on the extent and influence of pollution, and the sources of pollution to the bay areas, has been or will be presented for the record of this conference by the conferees. Suitable reduction in the strength and volume of this waste discharge will afford greater protection to the shellfish resources in the area in providing a safer product for human consumption and could result in the possible reopening of some presently closed areas. Such reduction of this pollution is obviously in the interest of public health and will be supported by the United States Public Health Service.

In relating the impact of water pollution and its control to the safe consumption of shellfish, these points should be emphasized:

1. Implementation of abatement plans and procedures for municipal sources of pollution as outlined by the New Jersey State Department of Health, and as stated in the Federal Water Pollution Control Administration's conference report, could increase the number of acres of estuarine waters for safe harvesting of shellfish, but would not restore all of them to open status under present requirements of the "National Shellfish Sanitation Program Manual of

Operations," Parts I, II and III. I am furnishing copies of these parts of the Manual for the record of this conference.

2. It is important to point out, however, that even though point sources of pollution may be entirely controlled, some estuarine waters adjacent to highly urbanized land areas may never be safe for shellfish harvesting, because of normal surface runoff during periods of high rainfall and the attendant flushing of both chemical and bacterial pollutants from these urbanized areas.

Water Contact Recreation

It has been estimated that 45,300,000 visitor-days can be attributed to use of the 31 public bathing areas, most of which are along the ocean. The Federal Water Pollution Control Administration's conference report concludes that:

"...bacterial contamination of these waters constitutes a hazard to health and welfare of persons utilizing these waters for recreation."

However, there are no data in that report indicating the degree of bacterial pollution of the waters now used for water contact recreation. It should be pointed out that only a very small percentage of these 45,300,000 visitor-days

are spent in the estuarine bathing areas. It is misleading to imply that the people utilizing the ocean bathing beaches are in danger of contracting disease. The bacterial levels, if any, in the ocean are much lower than in the estuaries because of dilution and flushing action.

It has also been observed that water quality criteria, as adopted by the State of New Jersey for the water contact uses -- including fresh surface waters, tidal waters, and coastal waters -- do not contain limiting conditions for bacterial characteristics. We believe that it is important, not only to establish reasonable bacterial standards for recreational uses, but to monitor bathing areas so as to assure that people are not exposed to water-borne disease and to post beach areas if a high risk of contracting disease exists.

What impact do direct waste discharges and seepage from septic tanks and cesspools have upon bathing waters? It seems logical that such a determination should be made prior to the establishment of final water pollution control plans. I am sure that the hundreds of thousands of people who use the coast of New Jersey as a summer playground would be interested in the relative safety (from a potential disease standpoint) of these waters for contact recreation.

The Department of Health, Education, and Welfare

is now developing recommendations for submission to the Secretary of Interior regarding bacteriological, chemical, radiochemical, and physical water quality standards for various water uses. These recommendations will reflect the health aspects of water quality.

The Public Health Service Act, as amended by P. L. 89-749 (Comprehensive Health Planning Act) provides for health services development project grants under Section 314(e). Perhaps the New Jersey State Department of Public Health would see fit to devise a study to develop new methods or improve existing methods for monitoring water quality in high use recreational areas.

Water Supply

It is noted that the Federal Water Pollution Control Administration conference report states that all municipal and institutional water systems in the three-county area (Ocean, Atlantic and Cape May) rely on groundwater sources. Generally, the pollution threat to groundwater sources in this area would be created by percolation of septic tank or cesspool wastes into the aquifers. On a national basis, there have been reports of contamination of water supplies due to failure in well casings. When a well casing does fail, effluents from septic tanks or

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cesspools, or contaminated surface waters may short-circuit into the well supply.

The recommendation in the Federal Water Pollution Control Administration conference report that the use of cesspools and septic tanks be reduced to improve shellfish growing waters is well taken. But, alleviation of another public health hazard might be realized by such action, and that is protection of drinking water supply sources. The great use of coastal New Jersey as a playground for out-of-State visitors highlights the need for protecting and improving public water supplies to prevent the transmission of water-borne diseases from State to State.

It should be pointed out that the New Jersey State Department of Health has established new potable water standards which became effective October 1 of this year, and if adequately implemented should lead to improvements in public water systems. These new water supply standards have been patterned after the 1962 Public Health Service Drinking Water Standards, which have been endorsed by AWWA as minimal for all public water supplies. The State of New Jersey has also passed legislation, Assembly Bill No. 697, effective July 26, 1967, requiring that all property owners connect to public water and sewer lines as they become available. Such legislation historically has received strong

endorsement from the Public Health Service.

Evaluation of individual sewage disposal systems, and the extent to which they pose health hazards in specific areas should be determined as part of any concerted pollution control effort.

Summary

The epigraph contained in the Federal Water Pollution Control Administration's conference report refers to the deleterious effect which pollution or contamination can have on fish and wildlife resources in coastal waters. We feel that the threat posed to human health by such pollution or contamination is of even greater significance. This is a threat to consumers eating raw shellfish taken from contaminated waters, and also a potential threat to persons bathing in polluted water or consuming water from polluted aquifers.

Efforts of the State of New Jersey towards preventing the transmission of disease by controlling pollution or preventing the harvesting of shellfish from polluted waters so as to better protect public health are commendable. The enforcement of recent State legislation regarding regulation of public water supplies, and requiring the use of available public water supply and sewage disposal systems,

will go a long way towards improving public health.

We wish to add our endorsement of recommendations Nos. 10 and 12 -- and please insert No. 13, which is not in the copy of my report -- of the report of the Federal Water Pollution Control Administration. These recommendations, if properly carried out, will provide greater safety for the consumers of shellfish taken from the waters in question.

It is recommended, however, that additional facts be determined and evaluated prior to closing the books on this water pollution control conference. It is the Public Health Service position that this conference be reconvened at a later date and after certain actions are taken:

- a. Bacteriological water quality standards for bathing waters are established by the State of New Jersey and approved by the Secretary of Interior;
- b. the quality of water now used for water contact recreation is determined; and
- c. the extent of waste treatment facilities, such as cesspools, septic tanks and wastes from watercrafts is determined and their impact upon specific shellfish growing waters, water contact recreation areas, and water supplies -- both public and private -- is

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evaluated.

It is believed that the proper evaluation of such information is necessary before complete plans can be established for controlling pollution in this important playground for the Eastern United States. The New Jersey State agencies concerned with implementing any of the above suggestions and recommendations can be assured of all possible cooperation and assistance from the Public Health Service in such actions.

MR. STEIN: Thank you, Mr. Van Derwerker.

Are there any comments or questions?

MR. KLASHMAN: I have none.

MR. STEIN: Dr. Kandle?

DR. KANDLE: No.

MR. STEIN: Thank you very much, Mr. Van Derwerker.

We will stand recessed for lunch, and we will reconvene at two o'clock.

(Whereupon, at 12:40 p.m., a luncheon recess was taken.)

(The National Shellfish Sanitation Program Manuals of Operation, Parts I, II, and III, submitted by Mr. Van Derwerker, will be found as an exhibit in the files of the Department.)

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AFTERNOON SESSION

(2:00 P.M.)

MR. STEIN: May we reconvene?

Mr. Klashman?

MR. KLASHMAN: I should now like to call on
Colonel Edward T. Watling, Deputy District Engineer, U. S.
Corps of Engineers, Philadelphia District.

Colonel Watling.

STATEMENT OF LIEUTENANT COLONEL EDWARD
T. WATLING, DEPUTY DISTRICT ENGINEER,
U. S. CORPS OF ENGINEERS, PHILADELPHIA
DISTRICT, PHILADELPHIA, PENNSYLVANIA

COL. WATLING: Thank you, Mr. Klashman.

I am Lieutenant Colonel Watling, Deputy District
Engineer of the Philadelphia District of the Corps of
Engineers, but I would like to mention that I am appearing
here today representing the North Atlantic Division of the
Corps of Engineers.

Since this part of New Jersey we are interested
in falls in two of the districts which make up the North
Atlantic Division, namely, the New York District and the
Philadelphia District, and since the Philadelphia District

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has the lion's share of this area, we have been asked to represent the Division.

As you know, the Corps of Engineers has had a continuing interest in the subject of pollution and its enforcement of its obligations insofar as navigable waters are concerned.

I would like to mention, before getting into my prepared notes, two specific examples of this. One is, of course, the enforcement of the law of 1899 prohibiting the deposition of refuse upon navigable waters, in which we prosecute for such matters as oil pollution.

Second, there is a standard provision in our agreement with the local authorities for our beach erosion projects for many years, to require an assurance that the local government will provide control of pollution to safeguard the bathers at the beaches, which is partially financed as a Federal project.

We are, of course, interested in all navigable waters, but our primary interest in here this afternoon lies in those waters in which we have an approved Federal project or which we are studying with a view toward a Federal project.

My prepared notes will be directed toward our areas of Federal project interest along the New Jersey coast

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and studies which we have under way.

The authorized Federal project for the New Jersey Intracoastal Waterway extends 117 miles from Manasquan Inlet at Point Pleasant, New Jersey, to the Delaware Bay entrance of the Cape May Canal in Cape May County, New Jersey. The project authorization provides for a channel 12 feet deep and 100 feet wide; however, it is being maintained at a depth of six feet pending completion of a study to determine the need for additional depth and possible realignment. Annual maintenance dredging is performed on the waterway to remove shoals. Disposal sites for the dredged material are provided by the New Jersey Department of Conservation and Economic Development in accordance with a requirement of local cooperation. These sites are coordinated with the U. S. Fish and Wildlife Service, the New Jersey Division of Fish and Game and the New Jersey Division of Shell Fisheries to prevent or minimize any harmful effects to marine life and wildlife habitat which may result from the disposal of the dredged material.

There are Federal navigation channels in four of the coastal inlets which connect open waters with the inland waterway. Those inlets are Barnegat Inlet, Manasquan Inlet, Absecon Inlet and Cold Spring Inlet. Maintenance dredging has been performed periodically in Manasquan,

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Absecon and Cold Spring inlets by Corps-owned hopper dredges. Disposal of material is accomplished by bottom-dumping in the ocean as close to the beach as possible in the hope that it may benefit eroding beaches. There was no maintenance dredging performed in Barnegat Inlet between 1956 and last summer, when a small side casting dredge was used to remove critical shoals. There is another authorized Federal coastal inlet, Shark River Inlet, located six miles north of Manasquan Inlet which connects Shark River with open waters. Maintenance dredging was last performed at Shark River Inlet in 1949 by contract. The material was disposed of by pumping inshore.

The Philadelphia District is presently engaged in a study of all the New Jersey beaches and inlets from Sandy Hook to the Delaware Bay entrance of the Cape May Canal. Included will be consideration of the proposed Shrewsbury Inlet, near the base of Sandy Hook, which has been authorized but not constructed. The study will be presented in four interim reports and a summary report. The first of the interim reports, covering the reach from Great Egg Harbor Inlet to Stone Harbor, was recently completed. This report recommends that Federal navigation channels be provided in Great Egg Harbor Inlet, Corson Inlet and Townsend Inlet. The second report, covering the reach from

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Hereford Inlet to Delaware Bay entrance of Cape May Canal, is scheduled for completion in November 1967. We have only recently initiated work on the third section, which will cover the reach from Barnegat Inlet to Great Egg Harbor Inlet. We hope to get started on the fourth and last section, covering the reach from Sandy Hook to Barnegat Inlet, very shortly, and to complete the entire study late next year.

Pending consideration by Congress of our recommendations for improvement of the inlets, we have performed emergency dredging in Townsend, Hereford and Corson Inlets last summer. The work was accomplished by the same dredge that performed the maintenance dredging in Barnegat Inlet. It is a special piece of equipment which removes the material from the channel and immediately casts it out to the side through a long pipe as the dredge moves through the water.

We also have authorization to study the feasibility of constructing a new inlet across Island Beach, approximately six miles north of Barnegat Inlet. Local interests who have requested the study feel that an inlet at that location would help to reduce pollution in Barnegat Bay as well as provide easier access to the ocean for large numbers of boats in the popular Toms River and Forked River areas.

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The improvement and stabilization of the inlets is important to the flushing and dilution effect on the inner bay waters. The magnitude of the tidal prism of the bay is dependent upon the shape and size of the bay and upon the efficiency of the inlet to transmit the tidal flow. When inlet areas shoal to such an extent that the flow through the inlet is reduced, there is a consequent reduction in the waters used to fill the tributary bay area, with a dampening effect on the circulation of water and the flushing action in the bay. Our dredging operations improve the hydraulic flow characteristics of the inlets and circulation of water in the bays. We control the dredging operations, both in the inlets and in the waterway itself, so that no potholes which could become pollution pockets are formed.

As you probably know, the Corps of Engineers has the responsibility for issuing permits for any structures on navigable waterways including tidal areas. In that connection, we received many protests against the issuance of a permit to the Toms River Chemical Company for the construction of an outfall pipe to extend approximately 3,500 feet into the ocean. The finding of fact for this permit indicated that this outfall would not have an adverse effect on the public rights of navigation and subsequently

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a permit was issued. After completion of the outfall, we made visual inspections which revealed no discoloration or pollution to the waters in the vicinity of the outfall. Samples collected in the vicinity showed clear water without visible solids or offensive odors. A permit was also issued by the New Jersey Department of Health for this outfall which provides for monitoring of effluent discharge by that agency. State laws and regulations give the New Jersey Department of Health control and authority to suspend or discontinue use of this facility if necessary.

In conclusion, I would like to state that the Corps of Engineers is deeply concerned about pollution in our waterways and we stand ready to cooperate in a pollution abatement program to the fullest extent permitted by Federal law.

MR. STEIN: Thank you, Colonel.

Are there any questions or comments?

MR. KLASHMAN: I have none.

DR. KANDLE: None.

MR. STEIN: Thank you very much for your statement.

By the way, Colonel, are you discharging any of this dredging on solid land, or is it all going into the ocean?

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COL. WATLING: It goes in both places, sir. Some of the dredging that takes place in the waterway itself is disposed of on shore.

MR. STEIN: Where? Behind jetties or in marshlands?

COL. WATLING: Behind jetties, normally.

We must coordinate with the Wildlife Service before we go killing any good marshlands.

MR. STEIN: You don't have much of a problem here. You know, we have been working with General Woodbury on the Lake Michigan situation. You don't know how lucky you are.

Have you heard about that?

COL. WATLING: Yes, sir.

MR. STEIN: When you put the material that you dredge overboard, does that just flow away?

COL. WATLING: No. It generally stays in place. We have just done this overboard dredging in this area for the first time.

MR. STEIN: How is it working?

COL. WATLING: It is working very well. It is heavy material and tends to pile up and stabilize.

MR. STEIN: Your dredging is not polluted material largely, is it?

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COL. WATLING: No, it is not.

MR. STEIN: What is your experience with that Toms River Chemical Company?

COL. WATLING: The only thing we have to remark on, sir, is the fact that we have had no difficulty whatsoever with any noticeable pollution from this outfall after it was constructed.

We attended to it rather extensively because of the public opposition voiced to it, and we have found no reason to consider an error was made.

MR. STEIN: You know, this is always the problem. It is a jurisdictional problem.

You indicated that if you issued the permit it would not have an adverse effect on public rights or navigation. I don't know that anyone ever thought that the Toms River Chemical Company would affect navigation, since they were concerned about other problems, but your view is that there aren't any other problems?

COL. WATLING: Yes.

I should say for the record, Mr. Stein, that although our permit authority is based upon navigational matters, it would be extremely unusual for us to issue a permit for such a project in the face of objection by the State of New Jersey, for example, or by another Federal

agency, such as the Department of the Interior, so that although the permit is based on our legal authority to issue permits insofar as they affect navigation, we do coordinate thoroughly with the State and local authorities.

MR. STEIN: Yes. Thank you very much, Colonel.

Mr. Klashman?

MR. KLASHMAN: Is Mr. Bob Snyder from the Small Business Administration here?

(No response.)

MR. KLASHMAN: Are there any other Federal agencies that wish to be heard?

(No response.)

MR. KLASHMAN: Mr. Stein, Mr. Snyder called us and indicated he would be here in about twenty minutes or a half an hour. We would like to work him in sometime within the State presentation.

MR. STEIN: We will wait until the State presentation is through.

We will now turn to Dr. Kandle for the State of New Jersey.

DR. KANDLE: Mr. Chairman, before I begin my official presentation of New Jersey's stand, I would like to make a comment about Mr. Sutton's report, which included the figure of \$4,518,000 of Federal aid over an eleven-year

period, which was concerned with 22 projects in this area which had a total cost of roughly \$13 million.

These money issues are apparently difficult, and I know they can turn numbers around sometimes, but I do think we have to hammer away at this issue of this money, because it is of basic importance.

These data are correct with regard to the 22 projects which were involved with Federal aid. Obviously, not all of the projects, by any means, in pollution abatement do get Federal aid. As a matter of fact, as a whole, the people of this State spend about \$60 million a year on sewerage systems and plants, and of that amount of money per year, the Federal participation is generally of the order of \$3 to \$5 million, so that the majority of the projects do not get any Federal participation whatever, and up until this year there haven't been any State construction moneys, so that means again, and this is one of the points I want to emphasize, that the local people pay the bill, in this case \$60 million a year in New Jersey.

I don't have a comparable figure, Mr. Chairman, to say what additional projects were built in this area with local money. I just don't have it, I am sorry to say. It has got to be at least twice that.

Of course, if annually it is \$60 million,

obviously the big projects are up in the more heavily and densely populated areas, but I think we have to recognize that basically the local people pay the bill.

Incidentally, in addition to the plants and the large trunks in which the Federal Government does participate, the collection systems still have to be paid for by the local people, and even if they are on revenue bonds, they still have to pay the interest. These dollars that we are talking about are local dollars essentially.

STATEMENT OF ROSCOE P. KANDLE, M. D.,
CONFEREE AND COMMISSIONER, NEW JERSEY
STATE DEPARTMENT OF HEALTH, TRENTON,
NEW JERSEY

DR. KANDLE: Good afternoon, friends:

My name is Roscoe P. Kandle, M. D. I am
Commissioner of the New Jersey State Department of Health
and I present this statement as the New Jersey conferee at
this conference.

We are pleased, as usual, to join with the Federal
Water Pollution Control Administration in this conference.
Since June of this year we have been favored by an invitation of the U. S. Department of the Interior to three such

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conferences. Happily, the last two were constructive examinations of water pollution control progress and problems. Both of these conferences produced unanimous recommendations that New Jersey proceed to do exactly what it is doing and exactly on the timetable by which it proposes to do it. We hope and believe that the conference beginning today will be similarly constructive. If these conferences become much more numerous, however, they will then subtract further from the time and energy required to perform the tasks, abatement of pollution, that the conference participants unanimously agree need to be done.

We must emphasize -- and I know this gets dreary to those who have heard me before -- that especially in this conference we are dealing with people. People mean pollution. Tourists mean pollution. Boaters mean pollution. We want and encourage these folks. Nevertheless, they essentially are our problem about pollution, about the use of the waters, about shellfishing and just plain living in this area, and this is a sort of a balance to which we are adjusting ourselves all over the world.

It is the policy of the administration of New Jersey Governor Richard J. Hughes to pursue the abatement and control of water pollution with all possible vigor and with all the resources at our command. It is my responsibility

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and my intention as the State Commissioner of Health to carry out this policy.

A great deal has happened in New Jersey recently which indicates how seriously we regard the need for effective water pollution control. Included in this activity is the enactment of several statutes which give us additional means to carry out an effective control program.

Among other things, these statutes provide for State grants for the determination of the feasibility of regional collection and treatment systems. These statutes provide:

(1) For loans to regional groups or municipalities and other governmental agencies in order to pay the engineering costs of system design;

(2) Authority is granted to the Department of Health to disapprove any waste water treatment facility which is not a part of an appropriate regional system, and this is an extremely potent new law; and

(3) A new statute adopted this year provides that equipment and facilities whose primary purpose is water pollution control are exempt from property taxation, within certain formulas.

Yet another law adopted this year provides fully funded undergraduate and graduate scholarships. The

recipients of these scholarships agree as a condition of the award to serve with our Division of Clean Air and Water for at least three years upon the completion of their funded studies. Last month Governor Hughes announced the award of the first five scholarships under this program.

Finally, and perhaps the most important of all, a statute was enacted this year which authorizes the State of New Jersey to provide construction grant funds in a program compatible with the Federal grant system, and appropriates funds to match this year's Federal allocation. So it does look as though we are going to have to go back, but this, I hope, we will be glad to, because some additional Federal moneys look as though they will be available.

In February of 1967, by Administrative Order a new Division of Clean Air and Water was established in the Department. This Division is responsible for administering the Air Pollution Control Program, Solid Waste Disposal Program, and the Water Pollution Control Program. This reorganization increases our Department's administrative capability to deal effectively with these environmental pollution control functions in an integrated structure.

In the current fiscal year, appropriations have been made to permit an increase of the current water pollution control staff of 42 by the addition of 24 positions.

In the fiscal year beginning next July, we hopefully expect funds which will allow us to increase our staff to a more realistic level of 100 people.

In next year's budget request, we have also proposed the expenditure of more than \$200,000 to permit New Jersey to establish a network for the continuous monitoring of the water quality of its streams. This system, when installed, will tie into the remarkable data-handling facility already in operation as a part of New Jersey's air pollution monitoring network, and this is a remarkable thing.

I wish you would come up and visit with us and see it, Mr. Chairman and guests, because I think New Jersey has gone a long way.

I would like to talk now for a few moments about our most important responsibility in water pollution control, and that is the enforcement of the law. I will speak about the subject generally, and then relate enforcement activity to the area of specific interest to this conference.

The basis of our entire enforcement activity is a set of legally adopted water quality objectives. These water quality objectives vary for the different waterways of the State and are based upon the best possible use to be

made of the water.

In March 1967, public hearings were held in Asbury Park, Toms River and Ocean City to assure that any person having an interest in water quality would be given an opportunity to express his views before the final classifications of water quality standards in these areas were made. The hearings were well attended. Representation included industrialists, consulting engineers, municipal officials, conservationists, fishermen, shellfishermen, sporting groups and private citizens. As a result of considerations of these hearings, regulations concerning surface water classifications were promulgated by the State and became effective June 1st of this year.

Attached is a policy statement concerning these regulations, and, Mr. Chairman, if I may, I have several things to add and I would like to deal with them at the end of the presentation.

MR. STEIN: Yes.

DR. KANDLE: All fresh waters of the basin were classified FW-3 or better, meaning that all fresh waters are to be suitable for recreational purposes or better. Of essential concern to this conference are the tidal waters of the Atlantic Coastal Basin in which our shellfish grow. These were all classified as TW-1 waters, which are defined

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as follows: "Tidal surface waters suitable for all recreational purposes, as a source of public potable water supply where permitted and, where shellfishing is permitted, to be suitable for such purposes."

The setting of this standard means that it is our objective that all tidal waters be of a quality that will allow the taking of shellfish.

Attached is a copy of the "Regulations Concerning Classification of the Surface Waters of the Atlantic Coastal Plain." Effective June 1, 1967, the State Commissioner of Health also promulgated "Regulations Concerning Treatment of Wastewaters, Domestic and Industrial Separately or in Combination Discharged Into the Waters of the Atlantic Coastal Plain Including the Atlantic Ocean." These regulations require a minimum of 95 percent reduction of BOD, or a maximum of 15 parts per million of BOD in any effluent discharged into any fresh or tidal waters of the basin classified as TW-1 or FW-3 or better. Any discharge into the waters of the Atlantic Ocean classified as CW-1 or CW-2 must be treated to a degree providing a minimum of 85 percent reduction in BOD, or a maximum of 40 parts per million, and a copy of this regulation is attached.

It is the opinion of the Department that these minimum treatment regulations are sufficient to achieve and

maintain the adopted surface water classifications and criteria.

Of course, water quality objectives and the wastewater treatment regulations will be meaningless documents unless the authority in the statutes is invoked to insure that the requirements are in fact met. When the treatment regulations became effective on June 1st of this year, no wastewater treatment plant in the Atlantic Coastal Plain met the new requirements. They were legal. That is, they met the old requirements, but now they must meet the new ones, and none were in compliance at that time.

Beginning, therefore, on May 1st, the Department issued mandatory orders to the treatment plants with an effluent entering the Atlantic Coastal Waters. As of August 4th, 82 orders have been issued to the operators of treatment plants in this area. Of these, 72 orders were against facilities operating in the area covered by this conference. Covered by these orders are all the 85 treatment plants operating from Shark River south, excluding several operated by the State or Federal Government. These orders contain detailed timetables for the construction of treatment facilities. By the final date for compliance, November 30, 1970, treatment facilities must be constructed and in operation in conformity with the degree of treatment

regulations. These timetables will be enforced.

We have attached a complete list of all facilities under order and a copy of a typical order.

The keystone of our statewide program of effective water pollution control is the regionalization on a basin or stream valley basis of treatment facilities. It seems to me that this is one of the keys to the things that we have been talking about so far today.

New Jersey now has approximately 750 sewage treatment plants. This is possibly 500 too many. When adequate regional treatment facilities have been constructed in the Atlantic Coastal Basin, there surely will be a considerable reduction in the number of treatment plants now operating in this area. In order to achieve a rational and practical plan for the regionalization of treatment facilities on the Atlantic Coastal Plain, two vital studies needed to be done.

The first of these was a study of the engineering and financial feasibility of regional treatment systems on both the short-term and long-term basis. Under the State grant statute, this Department has provided \$255,000 of State money to the counties of Ocean, Atlantic and Cape May, and for the Manasquan River-Wall Township area, in order to complete feasibility studies in these areas. The product

of these studies is an appraisal of the extent to which regionalization is practical, an indication of which municipalities can join together and an estimate of the costs involved now and in the future.

The report of the Ocean County feasibility study is expected before the end of 1967. The reports for Cape May and Atlantic Counties and the Manasquan River-Wall Township area are expected to be completed in the spring of 1968.

In January of 1964, the County of Cape May, without the benefit of State funds, completed a feasibility study for the unsewered portions of that county.

A master sewer collection and disposal plan for the County of Monmouth was completed in March 1966. In this case also the county moved ahead on its own, performing its study with county funds. When these feasibility studies are completed and accepted by the Department, we will not thereafter approve plans for new or upgraded treatment facilities unless these plans are in accord with the findings of these regional feasibility studies.

The second study, which is just as important as the first, concerns the suitability of the use of the ocean for the disposal of treated effluent. We are convinced that it is not possible for the waters of the bays in this area to continue to receive increasing amounts of treated

wastewater and remain acceptable for shellfish harvesting and recreational uses. It is useful to note that for approximately forty years, the seashore communities from Sea Bright to Beach Haven have utilized the ocean for disposal of treated wastewater and sewage. The favorable effect of ocean disposal in preserving bay waters can graphically be seen from an examination of the charts, which show the condemned shellfish areas. Nearly all of Barnegat Bay remains approved for the harvesting of shellfish.

I believe this is one of the most critical issues of this conference. The bays simply cannot receive more sewage. They cannot continue to receive the sewage, even that which is now entering them, and still meet the water quality standards that have been adopted for these waters.

The necessary engineering studies had not been done, however, by Federal, State or local government, or anybody else, which are required to establish the feasibility in detail of ocean disposal of treated wastewater in this area.

Mr. Merrill stated, for example, that only one small study has been made of the offshore marketable shellfish problems with regard to pollution and such issues. This just had not been done, although we had the experience

of the use of the ocean above here, and we knew perfectly well that new and detailed studies were necessary if we were going to get anywhere.

More than a year ago, at a cost of \$200,000 of State funds, the Department of Health contracted for an oceanographic study to be done of the coastal waters from Atlantic City to Wildwood. This study evaluated all the factors that affect safe disposal, such as currents, ocean floor topography, temperature, depth of water, etc. Based on this study, it has been concluded that it can be entirely safe to dispose of highly treated wastewater in the ocean off the coast of Atlantic and Cape May Counties.

Mr. Chairman, just to remind you, there is a good deal of difference geologically between the upper part of this conference area and the lower part, which has a long, flat continental shelf, and this was the reason that it had never been used before for this purpose. The study also determined the best locations for outfall construction.

Now, some of this is in detail, but, as Mr. Merrill pointed out, every single proposal has got to be taken up individually and careful studies done over again to assure that the particular site is all right.

The other thing we have to recognize, of course, is that things change and ocean currents change, and so

these have to be monitored even after they are installed.

This year we arranged with the government of the counties of Monmouth and Ocean to provide State funds to these counties, by which they have performed similar studies -- that is, oceanographic studies -- off their respective coasts. The work for Monmouth County was completed in the summer just past, and the work for Ocean County will be done next summer. The cost of these two studies is approximately \$400,000, and the State just put up the money. I think we can all recognize that, by golly, that is cheap, because if we can manage it and still preserve our beaches, which we obviously have to do, this may solve a great many of our problems.

In the approval of plans of future treatment plant construction, we will adhere strictly to the findings of these studies with regard to outfall location, the distance from the shore, and other methods of disposal, etc.

Mr. Chairman, I remind you that New Jersey recognized before the turn of the century that there is a definite need for the proper handling of shellfish in the broad concept of maintaining public health.

Having recognized that fact, New Jersey streamlined its program to deal with the maintenance of proper shellfish handling procedures. The program has been in

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existence ever since. In 1925, New Jersey achieved national importance when a national cooperative shellfish sanitation program was organized, and New Jersey was immediately an integral part. The cooperative program involved the shellfish industry, the various State regulatory agencies and the Public Health Service. The cooperative program involved the shellfish industry, as you have heard, and about which you have heard this morning in detail. It was developed primarily to establish national standards and guidelines to assure uniform supervision and confidence for shellfish shipped on the interstate market. The national cooperative program is still operating, and it has done a remarkably good job of maintaining high quality of shellfish on the market.

New Jersey is still a participating member in good standing of that program, and we hold our position of good standing to be a very real asset. Why? Because it allows the New Jersey shellfish industry to compete freely on the interstate market. Without it, the market area for our industry would be confined within our own State boundaries. If we are talking about economic damage to the shellfish industry from the closed areas, we must immediately realize that any restriction with regard to not being on that Public Health Service list would certainly outweigh any economic damage which the industry is now experiencing. In order to maintain our position of good standing with the national cooperative program, we must,

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of course, fulfill our obligations. We must inspect, certify and maintain high standards of sanitation in our shellfish handling establishments; we must prevent the harvest of shellfish from waters that are unfit for that purpose, and a part of this program is carried out by the Department of Conservation and Economic Development; and we must classify all the potential shellfish-growing waters of the State as to their suitability for harvesting shellfish.

The last obligation, that of growing-water classification, is a major concern here today. Let me say that we in New Jersey have taken our responsibility to perform this task very seriously. In order to determine what classification is necessary, a sanitary survey is performed, using the combined forces of our shellfish program and the water pollution control program. Among the criteria considered in such a survey are:

- (1) Bacterial water quality;
- (2) presence of known pollution sources;
- (3) possibility of potential pollution sources;
- (4) industrial waste;
- (5) presence of sewage and/or treated sewage effluent;
- (6) hydrographic studies to determine dispersion patterns of pollutants; and

(7) the probability of boat pollutions.

We have heard a good deal about boat pollution, but certainly it does not seem to me that we have heard enough. It seems to me that the Federal Government and we have got to find ways of managing this currently now enormous and growing pollution from boats, and that means handling people in a way that we have not been able to do very well so far. A person gets on his boat and he is off without caring about it, unless one finds rather automatic methods of reducing pollution.

I want to emphasize that this classification process is not a one-way street. We open waters as well as we close them. We are happy to determine that improvements have been made in the disposal of pollutants and as a result find that some of our growing waters have improved in quality. Where this happens, we make every effort to reopen the waters promptly. There have been several instances of such reopenings in the last few years, and we certainly anticipate that there will be more.

As of this moment, our tabulations show an approximate total of 166,109 acres of potential growing waters involved within the framework of this hearing. Approximately 127,478 of the total of 166,109 remain fully

approved for the harvest of shellfish, with an additional 1,871 acres approved for half the year, thus making 80 percent of the potential growing waters available for market harvesting.

Some of the publicity regarding this meeting and the data presented emphasize the areas closed, and, of course, it is important, but I think, and I really do think, and I have worked at this a long while, that the remarkable part is that most of the waters are now open, and I believe this is really a major achievement of New Jersey.

According to the information contained in a report dated January 1963, issued by the U. S. Department of the Interior, Fish and Wildlife Service, not all of the areas that we have had to close can be fairly considered as commercially valuable for the harvesting of shellfish. Actually, it would appear from our data that only about 21,000 acres, or about 58 percent, of the closed area, would be of commercial value.

I was impressed this morning with the possibility that other methods of the shellfish industry might be able to make them more productive. I think that the actuality of these factors has got to be kept under close attention, particularly when we put them side by side with our tourist trade and with the great uses and a great many uses that are

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made of these waters, and, of course, as the Public Health Agency, we must maintain protection for the public from a public health point of view.

The water pollution control needs of this region covered by this conference can be met through the effective and concerted efforts of local, State and Federal government. For our part, we would like to assure local government that while we must enforce the water pollution control orders already issued, we will cooperate with and assist local officials in every way we can, and we will try our best to resolve the problems which come up, which sometimes seem insuperable.

Under the Clean Water Restoration Act, the Federal Government is authorized to grant funds for the construction of treatment facilities. I have talked about that. As a condition of the full use of this grant process, the State is subject to Federal review and approval of our water quality standards and our plans for their implementation.

This appears to be a fair arrangement. It seems to us, however, that through the abatement conference process and by other review techniques, our Federal associates are pursuing the supervision part with a lot more diligence than they are in supplying the capital grants. Of course, I

recognize that we have different people who are the decision-makers in this regard.

Unless by next year considerably more capital grant funds are made available, the Federal credentials to review and oversee these standards may fall into disrepute.

The Clean Water Restoration Act authorized a grant expenditure which would provide New Jersey with an allocation of approximately \$14 million this fiscal year and \$22 million next fiscal year. The Federal administration requested, however, that less than half of this money be appropriated this year, and, as a result, it seems likely that we may get as much as \$5.6 million, and I remind you that we will be spending at least \$60 million.

It is our estimate that to construct regional sewage treatment facilities required by our orders to serve the coastal communities in the area of this conference will cost 80 or \$85 million. This assumes the disposal of treated effluent by ocean outfall or the other possibilities. It does not include construction required by our orders of inland communities in the Atlantic Coastal Basin. It does not include the collection systems.

The portion of the \$5.6 million of the presently presumably available Federal money, which is only a part of the \$5.6 million, will, of course, be available to the people

in this area, because it is shared in the entire State.

Mr. Chairman, we submit that New Jersey has a creditable record of pollution control, and that we have a creditable record of the maintenance of the shellfish industry in spite of the hazards that are being produced by our fine tourist economy. We intend to do even better. We believe that the problem of money and science and some knowledge that we do not now have with regard to such things as outfalls in the ocean and the control of people in their boats, in their habits, are going to be of major considerations.

Mr. Chairman, we have some other people from New Jersey and I should like first, if I may --

MR. STEIN: Pardon me, Dr. Kandle. May we check and see if we have any comments or questions?

Dr. Kandle, that was an excellent statement. I don't know how excellent you realize it is in the audience, but, you know, at one point in Dr. Kandle's statement he had a split infinitive in the written statement, and in reading it he fixed it up. (Laughter)

DR. KANDLE: For the record, Mr. Chairman, I have submitted four attachments.

No. 1 is a policy statement of the New Jersey Water Pollution Control Program;

No. 2 are regulations concerning the treatment

of wastewaters, domestic and industrial, etc.;

No. 3 are regulations concerning the classification of surface waters of the Atlantic Coastal Plain;

No. 4 are the regulations establishing certain classifications; and

No. 5 is a copy of a typical order.

I would like and I request, Mr. Chairman, that these be included as if read.

MR. STEIN: They will be, without objection.

(The attachments to Dr. Kandle's statement are as follows:)

NEW JERSEY STATE DEPARTMENT OF HEALTH
DIVISION OF CLEAN AIR & WATER
WATER POLLUTION CONTROL PROGRAM

Tabulation of Orders Issued
Atlantic Coastal Basin
Shark River to Cape May

November 1967

MONMOUTH COUNTY

Municipality	Plant Name
Borough of Belmar	Municipal
Borough of Spring Lake Hts.	Municipal
Borough of Spring Lake	Municipal
Borough of Manasquan	Municipal
Township of Wall	New Jersey Highway Authority
Borough of Freehold	Municipal
Township of Freehold	Freehold Sewer Company
Township of Freehold	Wynnewood Sewer Company
Township of Freehold	Silver Mobile Home Park
Township of Freehold	Stonehurst
Township of Howell	Maxim Sewer Company
Township of Howell	Cricket Restaurant
Township of Howell	Southern Freehold Regional High School

OCEAN COUNTY

Municipality	Plant Name
Borough of Point Pleasant Beach	Municipal
Borough of Bay Head	Municipal
Borough of Lavallette	Municipal
Township of Dover	Dover Sewerage Authority
Borough of Seaside Hts.	Municipal
Borough of Seaside Park	Municipal
Township of Berkeley	Berkeley Township Sewerage Authority
Borough of Surf City	Municipal
Borough of Ship Bottom	Municipal
Township of Long Beach	Long Beach Sewerage Authority
Borough of Beach Haven	Beach Haven Sewerage Authority
Borough of Island Hts.	Municipal
Borough of Tuckerton	Tuckerton Municipal Utilities Authority
Township of Little Egg Harbor	Mystic Isles Sewerage Authority
Township of Dover	Board of Education
Township of Lacey	New Jersey Highway Authority
Borough of Point Pleasant Beach	Board of Education
Township of Jackson	Jackson Township Municipal Utilities Authority
Township of Jackson	Harmony Sewer Company

OCEAN COUNTY (CONT'D)

Municipality	Plant Name
Borough of Lakewood	Lakewood Water Company
Township of Lakewood	Leisure Village
Borough of Lakehurst	Municipal
Township of Stafford	Stafford Township Municipal Utilities Authority
Township of Brick	Brick Plaza
Township of Brick	Milza Realty Company
Township of Brick	Municipal
Township of Jackson	Board of Education
Township of Ocean	Mid-Jersey Sewerage Company
Township of Union	Indianola Sewerage Company
Borough of Lakewood	St. Gabriels College

ATLANTIC COUNTY

Municipality	Plant Name
City of Atlantic City	Atlantic City Sewerage Company
City of Atlantic City	Vornado Inc.
City of Atlantic City	Spencer Gifts
City of Pleasantville	Municipal
City of Ventnor	Ventnor-Margate Joint Sewerage Commission
Borough of Longport	Municipal
City of Somers Point	Somers Point City Sewerage Authority
City of Brigantine	Municipal
Town of Hammonton	Municipal
City of Egg Harbor	Municipal
Township of Monroe	Monroe Township Municipal Utilities Authority
Township of Hamilton	Atlantic County Public Buildings
Township of Hamilton	Board of Education
Township of Galloway	New Jersey Highway Authority
Township of Hamilton	New Jersey Expressway Authority
City of Linwood	Board of Education
Township of Galloway	Seaview County Club
Township of Hamilton	Atlantic City Raceway

CAPE MAY COUNTY

Municipality	Plant Name
City of Ocean City	Ocean City Sewer Service Company
City of Ocean City	Municipal
City of Sea Isle City	Municipal
Borough of Avalon	Avalon Sewerage Authority

CAPE MAY COUNTY (CONT'D)

Municipality	Plant Name
Borough of Stone Harbor	Municipal
City of North Wildwood	Municipal
City of Wildwood	Municipal
Borough of Wildwood Crest	Municipal
Township of Middle	Cape May Court House
Township of Middle	Garden Lake Corporation
Township of Dennis	New Jersey Highway Authority
Township of Lower	Board of Education

CAMDEN COUNTY

Municipality	Plant Name
Borough of Berlin	Municipal

BURLINGTON COUNTY

Municipality	Plant Name
Township of Washington	Pacemaker Inc.

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REGULATIONS CONCERNING TREATMENT OF WASTEWATERS,
DOMESTIC AND INDUSTRIAL SEPARATELY OR IN COMBINA-
TION, DISCHARGED INTO THE WATERS OF THE ATLANTIC
COASTAL PLAIN, INCLUDING THE ATLANTIC OCEAN

Pursuant to the authority vested in it under the provisions of Chapter 12, Title 58 of the Revised Statutes, the State Department of Health hereby promulgates the following regulations concerning treatment of wastewaters, domestic and industrial, separately or in combination, discharged into the waters of the Atlantic Coastal Plain.

- I. Henceforth, domestic wastes, separately or in combination with industrial wastes, prior to discharge into waters of the Atlantic Coastal Plain classified as FW-2 or FW-3 or TW-1, shall be treated to a degree providing, as a minimum, ninety-five percent (95%) of reduction of biochemical oxygen demand at all times including any four-hour period of a day when the strength of the wastes to be treated might be expected to exceed average conditions; it is an objective of this regulation that the biochemical oxygen demand of effluents discharged shall not exceed 15 parts per million.

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- II. Henceforth, industrial wastes, prior to discharge into waters of the Atlantic Coastal Plain, classified as FW-2, FW-3 or TW-1, shall be treated to a degree providing, as a minimum, ninety-five percent (95%) of reduction of biochemical oxygen demand at all times and such further reduction in biochemical oxygen demand as may be necessary to maintain receiving waters, after reasonable effluent dispersion, as specified in the rules and regulations entitled "Regulations Concerning Classification of the Surface Waters of the Atlantic Coastal Plain," effective May 24, 1967; it is an objective of this regulation that the biochemical oxygen demand of effluents discharged shall not exceed 15 parts per million.
- III. Henceforth, domestic wastes, separately or in combination with industrial wastes, prior to discharge into waters of the Atlantic Coastal Plain classified as CW-1 or CW-2, shall be treated to a degree providing, as a minimum, eighty-five percent (85%) of reduction of biochemical oxygen demand at all times, including any four-hour period of a day when the average of the wastes to be treated might be expected to exceed average conditions; it is an objective of this regulation that the biochemical oxygen demand of effluents

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discharged shall not exceed 40 parts per million.

- IV. Henceforth, industrial wastes prior to discharge into waters of the Atlantic Coastal Plain, classified as CW-1 or CW-2, shall be treated to a degree providing, as a minimum, eighty-five percent (85%) of reduction of biochemical oxygen demand at all times and such further reduction of biochemical oxygen demand as may be necessary in order to maintain the receiving waters in a quality as specified by the rules and regulations entitled "Classification of the Surface Waters of the Atlantic Coastal Plain," effective May 24, 1967.
- V. It is recognized, especially in connection with some industrial wastes, that the pollution load imposed upon the waters of the Plain cannot be evaluated fully exclusively by the biochemical oxygen demand test; therefore, each industrial waste problem shall be considered individually and treatment shall be required as needed to effect compliance with the Water Quality Criteria established for the various classifications of waters in the Plain.
- VI. Treatment standards set by these regulations are the minimum acceptable for the Atlantic Coastal Plain. Treatment more intensive than that specified herein-above shall be provided whenever it is determined

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by the State Department of Health that such treatment is necessary.

Filed with Secretary of State: May 1, 1967

Effective Date: June 1, 1967

* * *

REGULATIONS CONCERNING TREATMENT OF WASTEWATERS,
DOMESTIC AND INDUSTRIAL SEPARATELY OR IN COMBINA-
TION, DISCHARGED INTO THE WATERS OF THE ATLANTIC
COASTAL PLAIN, INCLUDING THE ATLANTIC OCEAN

WHEREAS, the State Department of Health is charged with the responsibility for the Water Pollution Control Program, including the approval of the designs of wastewater treatment facilities, in the State of New Jersey, and

WHEREAS, the citizens of this State, particularly the citizens in the Atlantic Coastal Plain, have been obliged in recent years to suffer repeatedly the consequences of the serious oxygen depletion and other exemplifications of pollution in waters of the Atlantic Coastal Plain, said exemplifications of water pollution constituting threats to the

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public health, comfort or property of citizens of this State, and

WHEREAS, the State Department of Health did promulgate rules and regulations entitled "Regulations Establishing Certain Classifications to be Assigned to the Waters of this State and Standards of Quality to be Maintained in Waters so Classified," effective September 1, 1964, and amended said rules and regulations on January 5, 1966 and March 6, 1967, and

WHEREAS, the State Department of Health has concluded after extensive investigations and analyses of factual data that more intensive treatment of wastewaters must be provided throughout the Atlantic Coastal Plain in order to attain water quality specified by the aforesaid regulations of the Department, and

WHEREAS, the State Department is of the opinion that the attainment and maintenance of water quality in the Atlantic Coastal Plain as specified by the aforesaid regulations of the Department is necessary in order to abate a present threat to the public health, comfort or property of citizens of this State,

NOW, THEREFORE, the State Department of Health promulgates the following regulations entitled "Regulations

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Concerning Treatment of Wastewaters, Domestic and Industrial, Separately or in Combination, Discharged into the Waters of the Atlantic Coastal Plain, including the Atlantic Ocean."

NEW JERSEY STATE DEPARTMENT OF HEALTH

Filed with Secretary of State: May 1, 1967

Effective Date: June 1, 1967

* * *

NEW JERSEY STATE DEPARTMENT OF HEALTH

DIVISION OF CLEAN AIR AND WATER

WATER POLLUTION CONTROL PROGRAM

REGULATIONS CONCERNING CLASSIFICATION OF THE SURFACE

WATERS OF THE ATLANTIC COASTAL PLAIN

WHEREAS, the State Department of Health of the State of New Jersey did promulgate "Regulations Establishing Certain Classifications to be Assigned to the Waters of this State and Standards of Quality to be Maintained in Waters so Classified," effective September 1, 1964, and amended the said Regulations on January 5, 1966 and March 6, 1967, and

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WHEREAS, in public hearings conducted by the State Department of Health on March 15, 22 and 29, 1967, classifications of the surface waters of the Atlantic Coastal Plain, as proposed by the State Department of Health, were presented to the general public, and WHEREAS, the State Department of Health has given careful and thorough consideration to all statements submitted at said hearings, as well as statements and briefs submitted thereafter, relating to the proposed Classifications of the Surface Waters of the Atlantic Coastal Plain,

NOW, THEREFORE, the State Department of Health promulgates the following regulations entitled "Classification of the Surface Waters of the Atlantic Coastal Plain."

NEW JERSEY STATE DEPARTMENT OF HEALTH

Roscoe P. Kandle, M. D.

State Commissioner of Health

Filed with Secretary of State: April 27, 1967

Effective Date: May 24, 1967

* * *

NEW JERSEY STATE DEPARTMENT OF HEALTH

DIVISION OF CLEAN AIR AND WATER

WATER POLLUTION CONTROL PROGRAM

CLASSIFICATION OF THE SURFACE WATERS OF THE
ATLANTIC COASTAL PLAIN

Pursuant to authority vested in it under the provisions of Chapter 12, Title 58 of the Revised Statutes, the State Department of Health hereby promulgates the following classifications of the surface waters of the Atlantic Coastal Plain. Standards of Quality to be maintained in these waters as established by the State Department of Health are attached hereto.

I. Class FW-1

Waters having the potential for this Class but which are not classified as such at this time may be recommended for such classification by public or private interests controlling the land area draining to the watercourse. Because of the restrictive-use nature of the FW-1 classification any waters thus designated must be contiguous with their source. Also, since the characteristics of surface waters are sometimes changed to the detriment of their natural biota by seemingly minor associations with domestic and/or agricultural activities, they must be inspected and approved before being classified. Requests for consideration in the classification of FW-1 waters should be directed to:

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New Jersey State Department of Health

P. O. Box 1540

Trenton, N. J. 08625

A. FW-1 Manasquan River Drainage

- Allaire State Park
1. That portion of the second southerly tributary of the Manasquan River west of Hospital Road situated wholly within the Allaire State Park boundaries.
 2. The easterly tributary of the brook feeding Brisbane Lake located wholly within the Allaire State Park boundaries downstream to its confluence with the westerly tributary.

B. FW-1 Cedar Creek Drainage

- Greenwood
Forest Fish
& Game
Tract
1. Webbs Mill Branch and tributaries situated wholly within the Greenwood Forest boundaries.
 2. Chamberlain's Branch and tributaries situated wholly within the Greenwood Forest boundaries upstream from the blueberry farm exception,

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also other tributaries to
Chamberlain's Branch situated
wholly within the Greenwood Forest
Tract boundaries.

FW-1 Wading River Drainage

1. Westerly tributary to the Howards-
ville Cranberry Bog Reservoir and
tributaries thereto situated wholly
within the Greenwood Forest Tract
boundaries.

C. FW-1 Barnegat Bay Drainage

- Island Beach 1. All the fresh water ponds on Island
State Park Beach State Park.

D. FW-1 Manahawkin Creek Drainage

1. Tommy's Branch from its headwaters
downstream to the Bass River State
Forest Recreation Area service
road.
2. Falkenburg Branch of Lake Absegami
from its headwaters downstream to
the lake.

E. FW-1 Mullica River Drainage

- Wharton 1. Deep Run and tributaries thereto
Tract from its headwaters downstream to

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Springer's Brook.

2. Skit Branch from its headwaters downstream to its confluence with Robert's Branch.
3. Tulpehocken Creek and tributaries thereto from its origin downstream to its confluence with Featherbed Branch.
4. The westerly tributaries to Tulpehocken Creek and those natural ponds within the lands bounded by Hawkins Road, Hampton Gate Road, and Sandy Ridge Road.
5. Stream in the southeasterly corner of the Wharton Tract lying between Ridge Road and Seaf Weeks Road down to the Wharton Tract boundary.
6. Brook and tributaries between and immediately to the west of Tyler-town and Crowleytown from its headwaters downstream to the head of tide at mean high water.
7. The easterly branches of the Batsto River from Batsto Village upstream

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to the confluence of the Skits
Branch.

8. Gun Branch from its headwaters
downstream to U. S. Route 206.

NOTE: All boundaries referred to as
they existed December 1966.

F. FW-1 Great Egg Harbor River Drainage

- | | |
|--|---|
| <u>Tuckahoe</u>

<u>Public</u>

<u>Hunting and</u>

<u>Fishing</u>

<u>Grounds</u> | 1. Hawkin's Creek and the next ad-
jacent tributary to the Great Egg
Harbor River lying to the north
from their origin downstream to
where the influence of impounding
occurs. |
|--|---|

II. Class FW-2

- A. Cranberry Brook and tributaries thereto upstream
from the intake of the Monmouth Consolidated Water
Company near the New York-Long Branch Railroad
Crossing.
- B. Shark River and tributaries thereto upstream from
Remson's Mill Road.
- C. Jumping Brook and tributaries thereto above intake
of Monmouth Consolidated Water Company near Old
Corlies Avenue.
- D. Main stem of Manasquan River and tributaries thereto

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upstream from Garden State Parkway.

- E. All fresh waters of the Plain, from Manasquan River to and including the Mullica River, upstream from the head of tide.
- F. Absecon Creek and tributaries thereto upstream from Atlantic City Reservoir Dam in the City of Absecon.
- G. Patcong Creek and tributaries thereto upstream from Patcong Lake Dam.

III. Class FW-3

- A. Lake Takanassee
- B. Poplar Brook

Deal Lake and tributaries thereto

Sunset Lake and " "

Lake Wesley and " "

Fletcher Lake and " "

Sylvan Lake and " "

- C. Shark River and tributaries thereto downstream from Remson's Mill Road to head of tide.
- D. Jumping Brook and tributaries thereto downstream from Old Corlies Avenue to head of tide.
- E. Silver Lake and tributaries thereto
 - Lake Como and " "
 - Spring Lake and " "
 - Wrick Pond and " "

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- F. Fresh water reaches of main stem of Manasquan River and tributaries downstream from Garden State Parkway.
- G. Absecon Creek and tributaries thereto downstream from above dam to head of tide.
- H. Patcong Creek and tributaries thereto downstream from Patcong Lake dam to head of tide.
- J. All other fresh waters of the Plain not delineated upstream from head of tide.

IV. Class TW-1

- A. All tidal waters of Shark River and tributaries thereto from head of tide to surf waters.
- B. All tidal waters of Jumping Brook and tributaries thereto downstream from head of tide to Shark River and to surf waters.
- C. Tidal waters of main stem of Manasquan River and of tributaries thereto downstream from near the Garden State Parkway to surf waters.
- D. All other tidal waters of the Plain downstream from the head of tide to surf waters.

V. Class CW-1

Ocean waters within 1,500 feet from mean low tide to a depth of 15 feet, whichever is more distant from the mean low tide line, from Sandy Hook to Cape May Point.

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VI. Class CW-2

Ocean waters of the Plain not included under Class CW-1
out to the "three mile limit."

Filed with the Secretary of State: April 27, 1967

Effective Date: May 24, 1967

* * *

RULES AND REGULATIONS

* * *

REGULATIONS ESTABLISHING CERTAIN CLASSIFICATIONS TO BE
ASSIGNED TO THE WATERS OF THIS STATE AND STANDARDS OF
QUALITY TO BE MAINTAINED IN WATERS SO CLASSIFIED

WHEREAS, Chapter 12 of Title 58 of the Revised Statutes of
New Jersey (N.J.S.A. 58:12-3) provides that no plant
for the treatment of domestic or industrial wastes
or other polluting substance, from which the efflu-
ent is to flow into any of the waters of this State,
shall be constructed except under such conditions
as shall be approved by the State Department of
Health, and

WHEREAS, The conservation of the quality and function of the
waters of the streams of this State into which

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effluents from sewerage facilities are discharged and the minimizing of pollution of these waters is the over-riding consideration of the Department of Health of the State of New Jersey in its consideration of the approvals of designs for such treatment works, and

WHEREAS, the maintenance of reasonable quality of the waters of the streams of this State is the primary basis upon which the State Department of Health approves of the design of proposed sewerage facilities, and

WHEREAS, the Interdepartmental Committee on Stream Pollution Control Problems, established by the State Commissioners of Health and Conservation and Economic Development, on April 9, 1964, recommended certain classifications be assigned to the waters of this State and standards of quality be maintained in waters so classified, be promulgated as regulations by the State Department of Health, and

WHEREAS, The State Department of Health has determined that classifications of the waters of this State and standards of quality to be maintained in such waters as proposed and recommended by the Interdepartmental Committee on Stream Pollution Problems

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in this State are reasonable and constitute a valuable administrative instrument to the Department in the administration of the New Jersey Stream Pollution Control Program,

NOW THEREFORE, The State Department of Health, pursuant to authority vested in it, promulgates the following regulations establishing certain classifications to be assigned the waters of this State and standards of quality to be maintained in such waters which are to be implemented from time to time by further regulations promulgated after public hearing defining the water or waters of this State to be assigned certain classifications and standards of quality to be maintained in such waters.

NEW JERSEY STATE DEPARTMENT OF HEALTH

Roscoe P. Kandle, M.D.

State Commissioner of Health

Filed with Secretary of State: August 10, 1964

Effective Date: September 1, 1964

* * *

REGULATIONS ESTABLISHING CERTAIN CLASSIFICATIONS TO BE ASSIGNED TO THE WATERS OF THIS STATE AND STANDARDS OF QUALITY TO BE MAINTAINED IN WATERS SO CLASSIFIED.

Fresh Waters

The fresh non-tidal surface waters of the State are herein classified as Classes FW-1, FW-2, FW-3 and FW-4. For each classification there follow definitions and stream quality criteria.

Class FW-1

Definition: Fresh surface waters designated by authorized State Agencies as being set aside for posterity to represent the natural aquatic environment and its associated biota.

Criteria

These waters shall be maintained, as to quality, in their natural state.

Class FW-2

Definition: Fresh surface waters approved as sources of public potable water supply. These waters are to be suitable for public potable water supply after such treatment as shall be required by the State Department of Health. These waters shall be suitable also for all

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recreational purposes including fishing, the propagation of native fish species desired for angling and other fish and aquatic life necessary thereto as well as any other reasonable uses.

Criteria

<u>Conditions</u>	<u>Allowable Limits</u>
1. Floating solids, settleable solids, oil, grease, artificial coloring matter and turbidity.	None of which are noticeable in the water or are deposited along the shore or on the aquatic substrata in quantities detrimental to the natural biota.
2. Toxic or deleterious substances (including mineral acids, caustic alkali, cyanides, heavy metals, carbon dioxide, ammonia or ammonium compounds, chlorine, etc.).	None which would affect humans or be detrimental to the natural aquatic biota.
3. Odor and taste producing substances.	None which are offensive to humans, detrimental to the aquatic biota or capable of producing offensive tastes and/or odors in water

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4. pH. supplies and fauna used for human consumption. Between 6.5 and 8.5 unless naturally outside thereof.
5. Dissolved oxygen. Not less than 5.0 p.p.m. for trout waters; otherwise 4.0 p.p.m.
6. Thermal discharges. None which detrimentally affect the natural aquatic biota, or reasonably anticipated reuse of the water.

Class FW-3

Definition: Fresh surface waters suitable for all purposes provided for under Class FW-2 except public potable water supply.

Criteria

<u>Conditions</u>	<u>Allowable Limits</u>
1. Floating solids, settleable solids, oil, grease and turbidity.	None which are noticeable in the water or are deposited along the shore or on the aquatic substrata in quantities detrimental to the natural biota.

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- | | |
|--|---|
| 2. Toxic or deleterious substances (including mineral acids, caustic alkali, cyanides, heavy metals, carbon dioxide, ammonia or ammonium compounds, chlorine, etc.). | None which would affect humans or be detrimental to the natural aquatic biota. |
| 3. Color, odor and taste producing substances. | None which are offensive to humans, detrimental to the aquatic biota or capable of producing offensive tastes and/or odors in fauna used for human consumption. |
| 4. pH. | Between 6.5 and 8.5 unless naturally outside thereof. |
| 5. Dissolved oxygen. | Not less than 5.0 p.p.m. for trout waters; otherwise 4.0 p.p.m. |
| 6. Thermal discharges. | None which detrimentally affect the natural aquatic biota, or reasonably anticipated reuse of the waters. |

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Class FW-4

Definition: Fresh surface waters except as provided for under Classes FW-1, FW-2, and FW-3. These waters are to have limited recreational value and ordinarily not be acceptable for bathing or fishing but shall be able to maintain some fish life even though they may not be suitable for the propagation of fish. These waters shall not be an odor nuisance and shall not cause damage to pleasure craft having occasion to traverse the waters.

Criteria

<u>Conditions</u>	<u>Allowable Limits</u>
1. Floating solids, settleable solids, oil and grease.	None which are noticeable in the water or contribute to the formation of sludge deposits along the shores.
2. Toxic and deleterious substances.	None in such concentrations as to cause fish mortality or inhibit their natural migration.
3. Taste and odor producing substances.	None which shall be offensive or that would detrimentally affect finfish, shellfish or other aquatic life in higher quality receiving waters.

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Neither shall it inhibit
the natural migration of
fish.

4. Dissolved oxygen.

Not less than 50% saturation.

Tidal Waters

The tidal surface waters of the State, including interstate waters, are herein classified as Classes TW-1, TW-2 and TW-3. For each classification there follow definitions and stream quality criteria.

Class TW-1

Definition: Tidal surface waters suitable for all recreational purposes, as a source of public potable water supply where permitted, and, where shellfishing is permitted, to be suitable for such purposes.

Criteria

<u>Conditions</u>	<u>Allowable Limits</u>
1. Floating solids, settleable solids, oil, grease, sleet and turbidity.	None which are noticeable in the water or are deposited along the shore or on the aquatic substrata in quantities detrimental to the natural biota.

R. P. Kandle

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| 2. Toxic or deleterious substances (including mineral acids, caustic alkali, cyanides, heavy metals, carbon dioxide, ammonia or ammonium compounds, chlorine, etc.). | None which would affect humans or be detrimental to the natural aquatic biota. |
| 3. Color, odor and taste producing substances. | None which are offensive to humans, detrimental to the aquatic biota or capable of producing offensive tastes and/or odors in water supplies and fauna used for human consumption. |
| 4. pH. | Between 6.5 and 8.5 unless naturally outside thereof. |
| 5. Dissolved oxygen. | Not less than 50% of saturation. |
| 6. Thermal discharges. | None which detrimentally affect the natural aquatic biota, or reasonably anticipated reuse of the water. |
| 7. Coliform bacteria. | The median MPN value in |

R. P. Kandle

shellfish growing areas
shall not be in excess of
70 per 100 milliliters.

Class TW-2 (As amended and filed with Secretary of State
January 5, 1966.

Effective date: March 1, 1966).

Definition: Tidal surface waters having limited recreational value and ordinarily not acceptable for bathing but suitable for fish survival although perhaps not suitable for fish propagation. These waters shall not be an odor nuisance and shall not cause damage to pleasure craft having occasion to traverse the waters.

Criteria

Conditions

Allowable Limits

- | | |
|---|--|
| 1. Floating solids, oil and grease. | None which are noticeable in the water or contribute to the formation of sludge deposits along the shores. |
| 2. Toxic and deleterious substances. | None in such concentrations as to cause fish mortality or inhibit their natural migration. |
| 3. Taste and odor producing substances. | None, either alone or in combination, which are |

R. P. Kandle

- offensive or that would
produce offensive tastes
and/or odors in fauna used
for human consumption.
4. pH. Between 6.5 and 8.5 unless
naturally outside thereof.
5. Dissolved oxygen. Not less than 50%
saturation.
6. Thermal discharges. None which detrimentally
affect reasonably anticipated
reuse of the waters.

Class TW-3

Definition: Tidal surface waters used primarily
for navigation, not recreation. These waters, although
not expected to be used for fishing, shall provide for fish
survival. These waters shall not be an odor nuisance and
shall not cause damage to pleasure craft traversing them.

Criteria

<u>Conditions</u>	<u>Allowable Limits</u>
1. Floating solids, settle- able solids, oil and grease.	None which are noticeable in the water or contribute to the formation of sludge deposits along the shores.

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- | | |
|---|---|
| 2. Toxic and deleterious substances. | None in such concentrations as to cause fish mortality or inhibit their natural migration. |
| 3. Taste and odor producing substances. | None which shall be offensive or that would detrimentally affect finfish, shellfish or other aquatic life in higher quality waters. |
| 4. pH. | Between 6.5 and 8.5 unless naturally outside thereof. |
| 5. Dissolved oxygen. | Not less than 30% of saturation or 3.0 p.p.m., whichever is less. |

Coastal Waters

The surf waters of the Atlantic Ocean are classified as Class CW-1.

Class CW-1

Definition: Ocean surf waters expected to be suitable for recreation use.

CriteriaConditionsAllowable Limits

- | | |
|--------------------------------|------------------------------|
| 1. Floating solids, settleable | None of which are noticeable |
|--------------------------------|------------------------------|

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- | | |
|---|--|
| solids, oil, grease and
turbidity. | in the water or contribute
to the formation of sludge
deposits along the shores. |
| 2. Toxic and deleterious
substances. | None which would affect
humans or be detrimental to
the natural aquatic biota. |
| 3. Color, taste and odor
producing substances. | None which are offensive
to humans, detrimental to
aquatic biota or capable of
producing offensive tastes
and/or odors in fauna used
for human consumption. |

* * * *

RULES AND REGULATIONS

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The State Department of Health of the State of New Jersey, pursuant to the authority vested in it by Chapter 177, Laws of 1947, hereby amends that portion of Regulations Establishing Certain Classifications to be Assigned to the Waters of this State and Standards of Quality to be Maintained in Waters so Classified relating to Class FW-2, FW-4, and Coastal Waters filed with the Secretary of State on August

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10, 1964.

STATE DEPARTMENT OF HEALTH OF THE STATE OF
NEW JERSEY

/s/ Roscoe P. Kandle

Roscoe P. Kandle, M. D.

State Commissioner of Health

Effective Date: May 1, 1967

Filed with Secretary of State: March 6, 1967.

Class FW-2

Definition: Fresh surface waters approved as sources of public potable water supply. These waters are to be suitable for public potable water supply after such treatment as shall be required by the State Department of Health. These waters shall be suitable also for all recreational purposes including fishing, the propagation and migration of native fish species desired for angling and other fish and aquatic life necessary thereto as well as any other reasonable uses.

Class FW-4

Repealed.

Coastal Waters

The waters of the Atlantic Ocean within 1500 feet

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from mean low tide or to a depth of 15 feet, whichever is more distant from the mean low tide line, are classified as CW-1.

The waters of the Atlantic Ocean not included under Class. CW-1 are classified as CW-2, out to the three (3) mile limit.

Class. CW-1

Definition: Ocean waters expected to be suitable for all recreational purposes including fishing, the propagation and migration of native fish species desired for angling and other fish and aquatic life necessary thereto as well as any other reasonable use.

Criteria

<u>Conditions</u>	<u>Allowable Limits</u>
1. Floating solids, settleable solids, oil, grease and turbidity.	None of which are noticeable in the water or contribute to the formation of sludge deposits along the shores.
2. Toxic and deleterious substances.	None which would affect humans or be detrimental to the natural aquatic biota.
3. Color, taste and odor producing substances.	None which are offensive to humans, capable of

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- producing offensive tastes and/or odors in fauna used for human consumption.
4. pH Between 6.5 and 8.5 unless naturally outside thereof.
5. Dissolved Oxygen Not less than 50% saturation.
6. Thermal Discharges None which detrimentally affect the natural aquatic biota.

Class. CW-2

Definition: Ocean waters expected to be suitable for all recreational uses, including those in Class. CW-1, except bathing.

Criteria

<u>Conditions</u>	<u>Allowable Limits</u>
1. Floating solids, settleable solids, oil, grease and turbidity.	None of which are noticeable in the water or contribute to the formation of sludge deposits along the shores.
2. Toxic and deleterious substances.	None which would affect humans or be detrimental to the natural aquatic biota.

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|---|--|
| 3. Color | None which would impair the quality of CW-1 waters or detrimental to aquatic biota. |
| 4. Taste and odor producing substances. | None which are offensive to humans, or capable of producing tastes and/or odors in fauna used for human consumption. |
| 5. Dissolved Oxygen | Not less than 50% saturation. |
| 6. Thermal Discharges | None which detrimentally affect the natural aquatic biota. |

* * *

NEW JERSEY STATE DEPARTMENT OF HEALTH

DIVISION OF CLEAN AIR AND WATER

WATER POLLUTION CONTROL PROGRAM

POLICY STATEMENT

September 1967

The Water Pollution Control Program of the State of New Jersey is a responsibility of the Division of Clean

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Air and Water within the State Department of Health. This statement of policy is intended as a supplement to the presentation entitled "Stream Classification - Standards of Quality - Implementation" submitted to the Secretary of the Interior of the United States Department of Interior under date of June 27, 1967, by the State Commissioner of Health.

It is the primary objective of the Water Pollution Control Program in New Jersey to protect and enhance the quality of all surface waters of the State including those classified as FW-1 which are to be retained for posterity in their natural state and which shall not be subject to any man-made wastewater discharges. The objective of protecting and upgrading our waterways will take precedence over allowable minimal quality limits for surface waters established through promulgation of rules and regulations.

In all situations where there may be an impingement of a lesser quality water upon that of a higher quality, it is the objective of the New Jersey program to upgrade the lesser quality water in order to protect or improve adjacent waters having a more critical use. It is anticipated that the surface water classification and the standards of quality for New Jersey waters will be subject

to continual review and revision to achieve our basic objectives.

The overriding consideration, however, regardless of the establishment of water quality levels is that of wastewater treatment requirements. The minimum degree of wastewater treatment now being permitted in the State of New Jersey is that commonly identified as secondary treatment. In New Jersey this means treatment necessary to provide as an absolute minimum 80% reduction of biochemical oxygen demand and a maximum permissible biochemical oxygen demand concentration of 50 parts per million. In most areas in New Jersey, this standard is raised to require biochemical oxygen demand reduction of 85% and 90% with appropriate maximum permissible biochemical oxygen demand concentrations. At many inland locations where only small tributaries to streams are available, the policy in New Jersey is either to prohibit the discharge of any effluent to surface waters or to require so-called tertiary treatment which is the reduction of biochemical oxygen demand of 95% as a minimum with a maximum concentration of 15 parts per million. It has been and is presently the policy of the Department that wastewaters prior to discharge into any fresh water streams in the State must receive as a minimum at least 90% treatment.

Year-round effective disinfection is an accepted method of treatment required in New Jersey for most domestic wastes and other wastewaters. Effective disinfection is hereby defined as:

(a) One (1) Mg/l combined chlorine residual after a thirty (30) minute contact period based on design flow or a twenty (20) minute contact period during peak hourly flow or maximum rate of pumping. Or

(b) Coliform organisms not to exceed an M.P.N. of 240 per 100 milliliters.

We consider that the reasonable dispersion of treated wastewater effluents into receiving waters shall be accomplished in such a manner that the area used for dispersion will be substantially free from unsightly or malodorous nuisances due to floating solids, sludge deposits, debris, oil, scum, substances in concentrations or combination which are toxic or harmful to humans, animals, plants, or aquatic life or that produce color, taste or odor of the water, or taint, fish or shellfish flesh.

The word "reasonable" as contained in the preamble to the "Regulations Establishing Certain Classifications to be Assigned to the Waters of this State and Standards of Quality to be Maintained in Waters so Classified" reflects the long-standing policy of the Department

to recognize the rights and interests of all water users in consideration of the fact that New Jersey's waterways are invaluable natural resources and are not to be abused by any segment of the State's population or its economy. Water courses are the natural means by which surface runoff and the used waters from communal living are removed. It is not the privilege, however, of any industry or community to utilize the theoretical capacity of receiving waters for disposal of wastes. Reasonableness can be defined as the establishment of an equitable balance between orderly growth and development and the protection of the health, comfort and property of the citizens of the State.

In the administration of its regulations pertaining to the classifications and standards of quality for the surface waters of the State, the Department of Health will, as provided for in the aforesaid regulations, concern itself with bacteriological quality and the influence of thermal discharges upon all of New Jersey's surface waters. The following allowable bacterial limits will thus be recognized and utilized in conjunction with appropriate sanitary surveys:

Coliform Bacteria M.P.N. Per 100 ml.

Class

FW-2 and FW-3	Not to exceed an average value of 1,000 during any monthly sampling period nor
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2,400 in more than 20% of samples examined during such period.

TW-1

Where shellfishing is permitted, the median M.P.N. value shall not be in excess of 70 and not more than 10% of the samples ordinarily exceed 330 where the three tube decimal dilution test is used. In all other areas, not to exceed an average value of 1,000 during any monthly sampling period nor 2,400 in more than 20% of samples examined during such period.

TW-2

None in such concentrations that would impair the waters for assigned uses.

TW-3

None in such concentrations that would impair the waters for assigned uses.

CW-1

Not to exceed an average value of 1,000 during any monthly sampling period nor 2,400 in more than 20% of samples examined during such period.

CW-2

None in such concentrations that would impair the waters for assigned uses.

The following allowable temperature increases will also be recognized:

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<u>Class</u>	<u>Allowable Temperature Increases</u>
FW-2 and FW-3	For Trout Waters: None that will exceed 5° F. rise above natural temperature until stream temperature reaches 70° F.; natural temperature will prevail above 70° F. For Non-Trout Waters: None that will exceed 5° F. rise above natural temperature until stream temperature reaches 87° F. except in designated heat dissipation areas; natural temperature will prevail above 87° F. except in designated heat dissipation areas.
All Tidal and Coastal Waters	None that will have a detrimental effect upon the natural aquatic biota or reasonably anticipated reuse of the waters.

In connection with waters classified as TW-1, the clause "where shellfishing is permitted" is not intended to exclude upgrading of those waters where shellfishing is not permitted. It is the continuing policy of the Department to not only protect existing approved shellfishing areas but to restore waters that now exist at levels of quality below those acceptable for shellfishing so that the people of the

area may be permitted to benefit thereby. This statement of purpose is supported by measures instituted within the past year including oceanographic studies along the major portion of the New Jersey seashore in order to obtain base line data necessary to judge the feasibility of removing sewage presently being discharged into condemned shellfishing areas.

Rules and regulations were promulgated and became effective March 1, 1966, amending the definition and criteria for TW-2 surface waters. A copy of these regulations is attached. This amendment was made to provide a more meaningful intermediate category between TW-1 and TW-3 in recognition of the need for the survival of fish. Taste and odor criteria were revised in recognition of possible synergistic effects upon fish.

As indicated above, bacterial quality considerations are to be utilized by the Department. Consequently, there are actually two principal controlling water uses as defined for Class TW-1 waters - with the highest category being for shellfishing purposes while the next lower being for bathing purposes. Where waters have been classified as TW-1 and where shellfishing is permitted, the more stringent bacteriological standards will apply, viz., median M.P.N. of 70 per 100 milliliters. In all other TW-1 waters, which are not approved as shellfishing areas, the next legitimate use -

that being for bathing purposes - will be recognized and the appropriate bacterial quality requirement will be applied, viz., not to exceed an average value of 1,000 during any monthly sampling period nor 2,400 in more than 20% of samples examined during such period. Although three major tidal surface water classifications have been established, there are actually four principal controlling uses as follows:

1. Shellfish harvesting.
2. All recreational activities including bathing and also as public water supply sources.
3. Limited recreation and ordinarily not acceptable for bathing but suitable for fish survival although perhaps not suitable for fish propagation.
4. Navigation and fish survival.

In the administration of its present regulations and policies, the Department of Health will not permit harmful sludge deposits in any of the waters of the State. Many North Jersey seashore municipalities have pumped sludge to sea during the winter months through individual outfalls for many years. Because of the rapid increase in population throughout this area and the increased year-round water contact recreation activities such as surfing, skin diving, etc., it is the policy of the Department to require, for

proposed treatment plants, acceptable sludge conditioning and handling facilities in lieu of disposal through existing outfalls.

In consideration of the dissolved oxygen standard for Class TW-3, it is our intent that the dissolved oxygen content of such waters shall not be less than 30% of the saturation value and not less than 2.5 parts per million of dissolved oxygen concentration. Any possibility that the present surface water quality criteria could result in a downgrading of present conditions is not valid since, as indicated previously, the overriding consideration is that of wastewater treatment regulations which in New Jersey have now been set at the highest practicable level.

It will be the policy of the Department, in its review of proposed wastewater discharges, to consider the effect upon the quality of receiving waters based on a minimum consecutive 7-day flow with a 10-year recurrence interval.

The rules and regulations of the Department for the preparation of plans for sewerage facilities require that proposed new sewerage systems be designed as separate sewers to convey sanitary wastes only. The so-called "combined" systems may be approved when it is demonstrated conclusively that there is no practical alternative. Most combined

sewer systems in New Jersey were constructed many years ago and presently serve only the large older cities. It is the policy of the Department to continue to seek Federal assistance in determining effective ways of dealing with pollution from such combined sewer systems.

We recognize the fact of increasing pollution from vessels and marinas and as a consequence have for a number of years supported bills introduced in the State legislature designed to meet this problem. However, the legislature has not seen fit to pass such measures notwithstanding the need to control vessel and marina-caused pollution. The Department shall continue to foster and support appropriate legislation necessary for the protection of the public health.

We also recognize that our lakes, ponds and other impoundments are experiencing the deleterious effects of nutrients from various sources. Our capability to deal with problems of eutrophication and other symptoms of undesirable aquatic changes will be improved with contemplated increases in technical staffing.

As indicated above, New Jersey has established 80% biochemical oxygen demand removal as the minimum permissible level of treatment. This basic treatment requirement was established after a detailed study of the highly polluted

Arthur Kill by the Interstate Sanitation Commission. The conclusions reached in this study were substantiated by other investigations made for the Arthur Kill and adjacent waters. Extensive studies were also made in the Delaware River Estuary by the Federal Water Pollution Control Administration and served as a basis for the establishment of minimum treatment requirements for that area. Oceanographic studies are continuing along the North Jersey shore in order to determine optimum ocean outfall locations that will be required to result in coastal water quality conditions being attained on the basis of wastewater receiving at least 85% treatment prior to discharge into these waters.

It is recognized that effective water quality surveillance plays a significant role in the implementation of New Jersey's Water Pollution Control Program. Modern water quality monitoring devices must be utilized to supplement the present manual sampling methods that have been used for many years. Actually, about a dozen monitoring devices have been operated on interstate waters by the Federal Water Pollution Control Administration, the United States Geological Survey and the Interstate Sanitation Commission. Data obtained from these sources are made available. In addition, the State Department of Health, in cooperation with the United States Geological Survey, has arranged for the

installation of a monitoring device located on an intrastate waterway. Similar arrangements are now underway in cooperation with the Survey for two additional locations. Of considerable significance, however, is the fact that the Water Pollution Control Program plans to establish additional automatic monitoring devices and will utilize the receiving and data processing facilities already being operated by the Air Pollution Control Program within the Division of Clean Air and Water. By coordinating the various air and water monitoring activities through central operations, our capabilities will be vastly improved.

Considerable data have been accumulated as a result of many years of manual sampling. In 1962, the State Department of Health and the United States Geological Survey entered into a cooperative long-range program to determine trends in surface water quality. The voluminous data collected by the Department since 1950 was utilized in making these evaluations with periodic reports published by the Survey. We shall continue to cooperate with the United States Geological Survey in the compilation and analyses of water quality data.

Treatment requirements were established for the Raritan River Basin in December 1965, setting forth minimum biochemical oxygen demand reduction of 80% and 90%. Since

that time, other treatment requirements have been established for other river basins. The regulations concerning treatment of wastewaters for discharge into the Hackensack River Basin also specify the 80% and 90% reduction requirement depending upon the classification of the receiving stream. These regulations specify the maximum permissible biochemical oxygen demand concentrations of 50 parts per million and 25 parts per million, respectively. These permissible concentrations are considered to be applicable for the Raritan River Basin also. Pollution Abatement Orders were issued in the past to all of the major dischargers to the waters of the Hudson River including the Arthur Kill. These Orders have since been amended to require minimum treatment of 80% reduction in biochemical oxygen demand. Here again, the maximum permissible biochemical oxygen demand concentration is considered to be 50 parts per million.

It is the continuing policy of the State Department of Health to cooperate and collaborate with the Federal Water Pollution Control Administration. In addition, it is our intent that this document shall serve as an instrument to strengthen and clarify the present stream classification, quality standards and implementation aspects of the total Program. Such measures as may be necessary to incorporate the various expressions contained herein into formal amendments

to appropriate existing rules and regulations of the Department will be initiated at the earliest possible time.

Roscoe P. Kandle, M. D.

State Commissioner of Health

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9-22-67

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RULES AND REGULATIONS

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The State Department of Health of the State of New Jersey pursuant to the authority vested in it by Chapter 177, Laws of 1947, hereby amends that portion of Regulations Establishing Certain Classifications to be Assigned to the Waters of this State and Standards of Quality to be Maintained in Waters So Classified relating to Class TW-2 waters filed with the Secretary of State on August 10, 1964.

STATE DEPARTMENT OF HEALTH OF THE STATE OF NEW JERSEY

/s/ Roscoe P. Kandle

Roscoe P. Kandle, M. D.

State Commissioner of Health

Effective Date: March 1, 1966

Filed with Secretary of State: January 5, 1966

CLASS TW-2

Definition: Tidal surface waters having limited recreational value and ordinarily not acceptable for bathing but suitable for fish survival although perhaps not suitable for fish propagation. These waters shall not be an odor nuisance and shall not cause damage to pleasure craft having occasion to traverse the waters.

Criteria

<u>Conditions</u>	<u>Allowable Limits</u>
1. Floating solids, oil and grease	None which are noticeable in the water or contribute to the formation of sludge deposits along the shores.
2. Toxic and deleterious substances	None in such concentrations as to cause fish mortality or inhibit their natural migration.
3. Taste and odor producing substances	None, either alone or in combination, which are offensive or that would produce offensive tastes and/or odors in fauna used for human consumption.
4. pH	Between 6.5 and 8.5 unless naturally outside thereof.
5. Dissolved oxygen	Not less than 50% saturation.

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6. Thermal discharges None which detrimentally affect
reasonably anticipated reuse of
the waters.

MEMORANDUM

283a

DATE December 10, 1965

TO: Commissioner Robert A. Roe
Commissioner Roscoe P. Kandle

FROM: Interdepartmental Committee on Surface
Water Pollution Abatement

SUBJECT: Criteria, Surface Water Classification, Class TW-2

In order to make the TW-2 Classification intermediate between TW-1 and TW-3 and to be compatible with Classifications of the State of New York, it is recommended that the following revisions be made in the subject classification:

1. Delete the words "or fishing" in the first sentence of the Definition.
2. Revise the Allowable Limits under Taste and odor producing substances to read:

None, either alone or in combination, which are offensive or that would produce offensive tastes and/or odors in fauna used for human consumption.

No conflict is expected in the application of the above revision to the already classified waters of the state.

Respectfully submitted,

G. R. Shanklin

George R. Shanklin
Chairman

R.A. Webster
Acting Secretary

O R D E R

WHEREAS, the State Department of Health of the State of New Jersey did promulgate "Regulations Establishing Certain Classifications to be Assigned to the Waters of this State and Standards of Quality to be Maintained in Waters so Classified," effective September 1, 1964, and amended the said regulations on January 5, 1966 and March 6, 1967; and

WHEREAS, the State Department of Health of the State of New Jersey did after public hearings conducted by the Department on March 15, 22 and 29, 1967 promulgate regulations entitled "Regulations Concerning Classification of the Surface Waters of the Atlantic Coastal Plain," effective May 24, 1967, and

WHEREAS, the State Department of Health of the State of New Jersey did promulgate regulations entitled "Regulations Concerning Treatment of Wastewaters, Domestic and Industrial Separately or in Combination, Discharged into the Waters of the Atlantic Coastal Plain, including the Atlantic Ocean," effective June 1, 1967, and

WHEREAS, the State Department of Health of the State of New Jersey has found through investigations made by its

representatives that the sewage treatment plants owned and operated by the Atlantic City Sewerage Company, in the City of Atlantic City, in the County of Atlantic and the State of New Jersey, do not conform to the aforesaid regulations of the State Department of Health, and are inadequate in capacity or unit design to properly care for, treat and dispose of the sewage received therein before effluents from the said sewage treatment plants are discharged into inland tidal waters of the Atlantic Coastal Plain, being waters of this State, thereby causing or threatening injury to the inhabitants of this State either in their health, comfort or property, and

WHEREAS, the State Department of Health of the State of New Jersey, in consideration of the aforesaid, is of the opinion that in order for the sewage to be properly, adequately and sufficiently treated at the said sewage treatment plants before effluents are discharged into the said waters of this State, the said sewage treatment plants must be altered, added to or improved in a manner approved by the State Department of Health, and

WHEREAS, the Federal Water Pollution Control Administration of the United States Department of the Interior

requires that orders issued under the Water Pollution Control Plan of the State of New Jersey, which Plan is subject to review by and approval of the Federal Water Pollution Control Administration, include a timetable of significant events including the contemplated dates for the completion of construction of sewage treatment projects, and

WHEREAS, it is incumbent upon the State Department of Health of the State of New Jersey, in conformity with the nation-wide water pollution control program of the Federal Water Pollution Control Administration, to be specific as to the minimum degree of sewage treatment meeting the approval of the said State Department of Health,

THEREFORE, NOTICE IS HEREBY GIVEN by the State Department of Health of the State of New Jersey pursuant to R. S. 58:12-2 to the Atlantic City Sewerage Company, in the City of Atlantic City, in the County of Atlantic and the State of New Jersey, requiring that the said Atlantic City Sewerage Company must and shall, prior to November 30, 1970, cease the discharge of improperly, inadequately and insufficiently treated sewage into the tidal waters of the Atlantic Coastal Plain, being waters of this State, and must alter, add to

or improve the sewage treatment plants operated by the Atlantic City Sewerage Company, including sewage treatment units designed to provide at all times a minimum of ninety-five percent (95%) reduction in biochemical oxygen demand of the sewage received at the said sewage treatment plants, the B.O.D. of the effluent of said plants not to exceed fifteen (15) parts per million, or if in lieu of the discharge of the effluents to said tidal waters an effluent is to be discharged into the Atlantic Ocean, then the treatment units shall be designed to provide at all times a minimum of eighty-five percent (85%) reduction in biochemical oxygen demand of the sewage received at the said sewage treatment plants, the biochemical oxygen demand of the effluents of said plants not to exceed forty (40) parts per million, and including units for effective year-round effluent disinfection, in order that the sewage received therein shall be cared for, treated and disposed of and the effluent discharged into the said waters in a manner approved by the State Department of Health of the State of New Jersey, and in order that the treatment and disposal of said effluent shall meet the applicable standards of water quality described

by regulations of the State Department of Health entitled "Regulations Concerning Classification of the Surface Waters of the Atlantic Coastal Plain," effective May 24, 1967, and, the regulations of the State Department of Health entitled "Regulations Concerning Treatment of Wastewaters, Domestic and Industrial Separately or in Combination, Discharged into the Waters of the Atlantic Coastal Plain, including the Atlantic Ocean," effective June 1, 1967, and in effecting abatement of pollution of the waters of this State within the time hereinabove provided shall execute the following work performance schedule:

- (1) Complete an engineering report upon the proposed basis of design of additions and alterations with review and approval of same by the State Department of Health on or before April 30, 1968;
- (2) Complete preparation of and secure review and approval of preliminary engineering plans on or before October 30, 1968;
- (3) Complete preparation of and secure review and approval of detailed contract plans and specifications on or before June 1, 1969;
- (4) Award construction contracts on or before

October 1, 1969;

- (5) Complete construction on or before November 30, 1970;
- (6) The work performance scheduled herein shall be in conformity with a master engineering plan for sewerage services in the County of Atlantic as approved by the New Jersey State Department of Health and the design of any ocean outfall sewer shall be in conformity with a feasibility study and report upon the design of such ocean outfalls along the coast of Atlantic County as approved by the New Jersey State Department of Health.

STATE DEPARTMENT OF HEALTH OF THE STATE OF NEW JERSEY

/s/ Richard J. Sullivan, Director

Division of Clean Air and Water

Dated: May 1, 1967

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MR. STEIN: The program outlined by Dr. Kandle, I think, was excellent. We have a couple of points.

I am really encouraged by that scholarship program of yours, Doctor. As far as I can see, you are going to

educate these people, and then, at least, you are going to train them for three years, and then after that we will see if we can recruit them.

DR. KANDLE: It could happen. (Laughter)

MR. STEIN: I would expect that there might be several alternative suggestions announced on the unanimous recommendations we have had in the last several conferences. I don't know whether it is the Federal Government or New Jersey, or both, that are growing closer together, but any time we can come up with unanimous recommendations and endorse the New Jersey program, it is a wonderful thing for Federal-State relations.

From what we have heard of the New Jersey program, I would think that this is as forward-looking a program as we have in the country.

Again, let me point out that here we have a really difficult problem. I don't think there is a difference between the State government and the Federal Government in what we are trying to do. We are faced with an inordinately difficult problem in South New Jersey, and that is how we can come up with the best possible solution,

The question here is, and I agree with you, how much of the New Jersey beds are available for commercial shellfishing. I don't know how many areas there are open

that are available for commercial shellfishing, but I think these conferences tend to point out what is bad and not what is good. Obviously, if there were not any areas open, we wouldn't have any clams in New Jersey, and you know we have a tremendous amount.

We have to face this problem, and I ask you all to face this with us, because I am not sure, with the fount of knowledge, that we have all the answers. I think we have a tremendous resort area and resort business on the Atlantic Coast in New Jersey. Potentially, we probably have the greatest shellfish producing area in the country.

Anyone can clean up pollution by shutting down an industry. That is not the challenge. The challenge is to handle this with this industry being here. We know the numbers of people are going to continue to grow, and I think you have a healthy growth right here, as was pointed out, a little above the New Jersey average. The resort industry is going to grow.

Our problem is simply this: Accepting a more accelerated growth of population, accepting the growth of the resort industry, because I think your resort area is here to stay, if we are going to have the maximum amount of water uses, how much of this water can we reclaim for safe shellfish harvesting and marketing? This is our sole question.

You know, I am kind of a beach fan, and I have a theory about beaches, and one of my theories is that the best beaches are the beaches which have been used pretty frequently; because when the people had the whole country to choose from they picked the best beaches, and among the best beaches is the Atlantic City beach, where we are right here, and up and down the coast of New Jersey, and possibly Coney Island. There are not many more and it is no accident that Atlantic City is Atlantic City.

I think, if we are going to retain that, we are going to have this resort industry, because you have a unique feature right out to my back that we just can't duplicate almost anywhere else in the country.

We know we have this natural facility for the beach here. We know we are going to have this tremendous resort community. We know in the East we have a potential of shellfish harvesting and marketing.

Now, if we proceed from the notion that we are going to continue because of the inexorable social pressure of keeping this resort area, and assuming the resort to be here, can we have the resort and can we have the shellfish harvesting at the same time?

I think Dr. Kandle's program in New Jersey points the way.



As far as I have read the statement and in discussing it with the staff, we have talked about three possible alternatives. I would like to throw this open to the conferees, and possibly for future discussion here, if any other people are going to come up.

The three possible alternatives were discharge into underground aquifers, discharge into the selected portions in the inland waterway, or ocean discharge.

Given the present state of art and what we know and what Dr. Kandle is pointing out in his statement, the most fruitful seems to be a commitment possibly to an ocean discharge for an immediate result in getting the maximum benefit of the water resources in this area.

At least, up to this point, after hearing Dr. Kandle, I would say that that is the direction that I have seen the scientific testimony go, and I don't see much of an appreciable difference between the State and the Federal position.

If any of you people who are coming up in the future want to address yourselves to this, this may be something to keep in mind.

Dr. Kandle, thank you very much for your statement. It was really excellent.

DR. KANDLE: We have several people from New

Jersey we would like to hear from, Mr. Chairman, if it is agreeable.

MR. STEIN: Yes.

DR. KANDLE: We would like to have the lady first, Mrs. Elizabeth Wallace of the Oyster Institute.

STATEMENT OF MRS. ELIZABETH M. WALLACE,
OYSTER INSTITUTE OF NORTH AMERICA, SAYVILLE,
LONG ISLAND

MRS. WALLACE: Thank you, Dr. Kandle.

Mr. Chairman, Mr. Klashman, and dear Recorder for the Record:

I am for everybody. I think that this job is going to take all of our time and talents and energy, and there is nothing left for anybody to be on one side or the other, because it is all the same side, as Murray Stein has just elucidated.

As the representative of the Molluscan Industry, the Oyster Institute of North America, I speak for the three major species of clams that are produced in our country.

As it became evident this morning, these are not exclusively one species or the other, because oysters and surf clams are tied up along with soft clams and scallops

in the consideration of the beneficial uses of these estuaries when we are considering food. It is not whether we have one or the other; it is that we have them all.

May I respectfully submit this little fact in relation to the surf clams, which are reaped in great abundance off the southern portion of the coast of New Jersey: The surf clam is caught out in the ocean. When it is eaten, it must be cooked, and the viscera is not used at all, and I think this should be part of the consideration here.

My testimony, which was written previously, of course, has its major impact in the field of hard clams, since this is the most profitable industry we are considering in this area of the conference.

Prior to the passage of Public Law 234 in 1965, which amended the Federal Water Pollution Control Act and established the Federal Water Pollution Control Administration, the Molluscan Industry was the helpless victim of encroaching pollution. Area after area was closed to the harvesting of shellfish.

The molluscan hearings before the House Merchant Marine and Fisheries Committee in 1962 established that the single greatest deterrent to our industry was the ever-increasing pollution. Our determination to extricate

ourselves from the dilemma coincided with the citizen's awareness that the deterioration of our coastal marine environments deprived them of recreation privileges and threatened vested interests as industries and homes crowded the seashore. Owners of pleasure craft found their investments and their pleasures diminish as the water quality of the estuaries declined. Now, with the encouragement and financial assistance of the Federal Government, the health and conservation agencies of New Jersey and of all the other States, and our industry, can hope that we can reclaim closed areas.

Dr. Kandle's report was most encouraging, as was that produced by the Federal Water Pollution Control Administration. New Jersey is blessed with excellent barrier beaches backed by productive bays. New Jersey produced 2,659,085 pounds of hard clam meats in 1966. The production of these bays stretching along the coast makes New Jersey the Number two producer of hard clams in the Nation.

With approximately 35,000 acres closed to shell-fishing in the peak of the tourist season, New Jersey suffers an economic loss from the inability to add the sea resources to its economy, compounded by the responsibility and expense of the surveillance of these areas. Moreover, these highly accessible waters represent a health hazard to the citizens of New Jersey and their summer guests.

May I add that there are 33,000 plus 2,000 now that are traditionally closed. With these being closed at the height of the tourist season, New Jersey suffers an economic loss from the inability to add the sea resources to its economy, compounded by the responsibility and expense of the surveillance of these areas.

Moreover, these areas are highly accessible waters which represent a health hazard to the citizens of New Jersey and their summer guests.

While we are on this economic loss, it bothers me a bit, because I don't think that money should be the prime criterion as to whether we do or do not do a job. There are other factors that are more important, in my humble opinion.

At one time Franklin County, Florida, was examined in relation to its oyster production, and you will find, Mr. Chairman, Dr. Kandle and Mr. Klashman, that a factor of 10 can well be put on this as an economic resource, and you may have a copy of that if you should want it. It was published by the Public Health Service, and you probably are aware of it.

The resort areas are world-famous and are Mecca for tourists searching for clean water, safe bathing, enjoyable boating, fishing, and related recreational activities. This tide of humanity will increase and the investments

of New Jersey's citizens will continue to be profitable so long as New Jersey is a healthful place to vacation.

New Jersey officials should consider the conference as a blessing to assist them to meet their responsibilities. We trust they, who have always been our friends, will use these marine resources as a rallying issue for all of us to work together.

The Molluscan Industry, with members in every marine State, has been and will continue to work for sufficient funding of the Federal Water Pollution Control Administration to accomplish that which must be done. Why can't the other organizations, such as hotel associations, restaurant associations, realtors, civic groups, and the service clubs, unit with informed citizens to support the State and Federal delegations to sponsor the necessary financial assistance?

It so happens that what is good for people, is exactly what is good for clams.

Thank you.

MR. STEIN: Thank you.

Are there any comments or questions?

MR. KLASHMAN: Off the record.

(Discussion off the record.)

MR. STEIN: Dr. Kandle?

DR. KANDLE: I have none. Thank you.

MR. STEIN: Thank you very much, Mrs. Wallace.

This is a wonderful statement. You know, Mrs. Wallace is a biologist and used to work in Maryland, and I never knew why she worked in this business.

Lib, if I didn't know you this long, I wouldn't say this, but you are the only one I know that many years who worked in this field who gets to look younger every day.

MRS. WALLACE: I admire your mature appearance.

(Laughter)

MR. STEIN: Dr. Kandle?

DR. KANDLE: We would like next to hear from Mr. Richard Crema, who is the Secretary-Treasurer of the South Jersey Shellfisherman's Association, and a fellow who has worked good and hard and knows this industry well.

STATEMENT OF RICHARD CREMA, SECRETARY-
TREASURER, SOUTH JERSEY SHELLFISHERMAN'S
ASSOCIATION

MR. CREMA: I would like to say first that we are not engineers or technical experts of any kind. We are just shellfishermen and we have to call things as we see them. We know our job and we know our area, and we know the product

and what's good for it.

My name is Richard Crema and I am Secretary of the South Jersey Shellfisherman's Association, and I am a shellfisherman.

We are the only local organization representing some 1,000 shellfishermen in Ocean, Burlington, Atlantic and Cape May Counties who derive their livelihood or part of it from the coastal estuaries of South Jersey.

We organized about three and a half years ago, principally to see what we could do to correct the shameful and harmful abuse and pollution of South Jersey's most valuable asset, the coastal bays, rivers and tributaries. This water is most valuable not only to shellfishermen, but to nearly everyone in these coastal counties, including hotelmen, motelmen, restaurant owners, and everyone else catering to tourists and sportsmen and the resort industry as a whole. What else is there in South Jersey, except the natural environment?

We have traveled long distances and done much investigation and study on our own and with other interested agencies and organizations to find out the causes and reasons and possible solutions to our severe pollution problems. We have learned a lot.

I said severe pollution problems and I mean just

R. Crema

that. Since we are in Atlantic City now, we will use this island as a prime example, as it just happens that this is the very heart of the most severely polluted waters in South Jersey. This is quite a record for the World's Play Ground! Here, as in many other places, there have been fabulous sums of money spent and being spent on urban development, fancy highways, city hall, and other things that are pleasant to the eyes. However, they forgot all about the most basic step in life, disposing of human waste without poisoning the whole environment and everyone and everything in that environment. They plan a model city in the middle of a big cesspool.

Actually, if the truth was published, just how filthy the waters are, surrounding Absecon Island, there would be a lot of tourists and vacationers who would not be back again next year.

As for economic damage or amount of loss which is caused by this pollution, it is very hard to put it in figures, but we have tried as follows:

Last year in Atlantic County alone, with about two-thirds of our waters closed due to pollution, there was about one half a million dollars worth of hard clams (bay clams) caught and sold. This is the value to the shellfish

R. Crema

industry itself. The value to the economy of the county would be several times this figure.

Cape May County is nearly all closed -- that is, the most productive parts of it -- for harvest of shellfish due to pollution, but with a tremendous potential if the waters were cleaned up.

For Ocean, Atlantic and Cape May Counties, the 1966 sales of clams were about \$1-1/2 million. This figure could be easily doubled with the cleaning up of our highly productive shellfish waters which are now closed to harvesting.

In summary, our figures show that there is 1-1/2 million dollars per year damage to the shellfish industry alone in the three southern counties due to water pollution, and, again, the damage to economics of the area just from shellfish would be several times this figure.

It should be kept in mind that none of these figures have included the value of the oyster industry. We feel that all our figures are a conservative estimate in every case.

New Jersey is at the present time the No. 2 producer of hard clams in the Nation, with no help at all. Therefore, with a little help, namely, pollution control, we could definitely be the No. 1 producer in the country. Hard clams now, and for the past few years, are growing

and thriving to an unbelievable potential. There are more clams growing and continuing to spawn now than ever in our history, both in our open waters and the condemned areas of southern New Jersey.

When considering the worth of our estuaries in food value, it should be noted that one acre of prime shellfish producing bottom can produce 10 times as much protein as an acre of the richest farm land in the country.

We all realize, I believe, that the economic value of the shellfish industry and annual damage done to it by pollution is only a drop in the bucket compared to the economic damage which is being done and that will be done to the tourist, recreation, and resort industry in South Jersey, by the presently filthy condition of the waters lapping the very shores and beaches of our resort cities, such as Atlantic City.

Of all the various types of areas in the country, a resort area should be the last to be allowed to become polluted and the first to realize the necessity of cleaning up when there is pollution. But here, many of the resort area planners, public officials, chambers of commerce, etc., are too near-sighted to realize this loss which they are suffering and not wise enough to voluntarily invest the needed money to stop this millions of dollars of annual loss.

The only way this loss can be stopped, is by regional trunkline outfalls in the ocean.

We have learned in our study of this problem and a lot of other people realize this also; that the sewage disposal plants on this island and others are the direct cause of nearly all of our water pollution. Other contributing factors make only a drop in the bucket. The general public is not aware of this yet. Most people think that as long as there is a sewage disposal system and plant, then everything is O.K. They don't know the large percentage of the sewage that goes in the bays raw due to overloaded plants, outdated treatment, malfunction, and "I don't care" attitudes.

Up until this past spring of 1967, no matter how hard or where we looked, we could see nothing being done about this shameful, deplorable destruction of our natural resources. Just a lot of "passing the buck."

Now, last spring, the New Jersey Department of Health took a giant step forward by classifying our waters as provided for in the Federal Water Quality Act, and then going ahead and issuing orders to the coastal municipalities to upgrade their sewage disposal systems with recommendations for regional sewer plants with secondary treatment and ocean outfalls or tertiary treatment with outfalls still in the bay. They had already spent \$200,000 in a study which

showed that ocean outfalls are feasible and would work well here, as in so many other parts of the country. We congratulated the Department of Health on this giant step forward, the first step that has ever been evident to us. We most sincerely hope that they will stand by their orders in every case, without any dilly-dallying around. Sure it will cost a lot of money, but it will save a lot more money than it costs, in a very short time. It will rescue and insure the entire economy of South Jersey. New Jersey is supposed to be a "home-rule" State and many people will resent the State forcing their hand in anything, but this has to be done, as the so-called "home-rule" has failed miserably and pathetically on the pollution problem.

There is one part of the State's orders which we do not agree with, however. This is the alternative of the tertiary treatment plants with the outfalls still in the estuaries. Our estuaries cannot stand to have these outfalls, for the simple reason that there is always the chance of human error and mechanical breakdown. As long as the outfalls are in the bays, no matter how good the treatment, we won't be beating the pollution problem and it won't be doing us (those in the shellfish industry) any good. This statement can be backed up by both State and Federal agencies.

The only down-to-earth, ultimate answer to our pollution problems is 100 percent ocean outfalls running from regional plants. There is absolutely no excuse for an area such as we have here to have a pollution problem when we have the whole Atlantic Ocean to absorb our waste, which it can definitely do, and is being done in many parts of our State and country very successfully.

However, many people are afraid that ocean outfalls will make a potential for dirty beaches. On the contrary. Our ocean front beaches are probably much more contaminated right now than they could ever be with ocean outfalls.

The reason: Right now we have ocean outfalls and they are practically on the beach, not with secondary treatment and not with three miles offshore, and most of it is raw sewage. This comes from Atlantic City sewer plant and Brigantine sewer plant, which are located just above Absecon Inlet. On an outgoing tide, this sewerage comes out the inlet and right down under the Steel Pier and on the beaches. Longport, Margate, Ventnor and Ocean City are dumping the same filth on the beaches by sending it out Great Egg Inlet.

Another important point in favor of ocean outfalls is that even when it goes three miles offshore, the sewerage is to be treated with secondary treatment, which is better than the treatment used now while dumping in the bays.

There may be other arguments against ocean outfalls, but for every doubt or argument we are sure that there is a positive, constructive answer in favor of ocean outfalls.

Ocean outfalls with regional sewer plants, whether the people here know it or not, will be the salvation of South Jersey. They will keep the increased and expanding population and stepped up industry from "killing the goose that lays the golden eggs" -- our famous water playground.

Our recommendations to this conference are that the State Department of Health pulls no punches at all in regard to their recent orders to the municipalities, and that if the State should fail to do this, then the Federal Water Pollution Control Administration should take steps to enforce the Water Quality Act and save South Jersey from becoming just an overgrown cesspool.

We further recommend that all parties take steps to insure the ocean outfall plan in lieu of the third stage treatment with outfalls in the estuaries. This latter is no answer to our pollution problem in South Jersey.

We would also like to recommend that the influential members of the resort and tourist industry in Atlantic and Cape May Counties be educated to the real fact, that they stand to lose much more than even the shellfishermen by not

getting the ocean outfall plan into reality in the near future.

This will make everyone's job easier, and the more people that really understand the seriousness of the problem, and the one and only way it can be resolved, the sooner the job can and will be done.

MR. STEIN: Thank you, Mr. Crema.

Are there any comments or questions?

MR. KLASHMAN: Mr. Crema, I personally want to thank you very much for your very fine statement.

Could I ask you: In the studies that you did, you were talking about the nature of estuary water, that it produced more protein than an acre of land. How many bushels do you figure an acre?

MR. CREMA: I don't have that figure in bushels. It is a statement that I read.

MR. KLASHMAN: What do you folks figure that you can get in that?

MR. CREMA: We have never tried to figure that out.

I could tell you, a lot of these figures that some people are able to come up, we don't have much of a way to come up with figures. We are not engineers and don't know how to come up with that sort of information.

We do know that certain types of shellfish produced can produce year after year, even unbelievable to us. Every year we figure this is it for this area for a while, and the next year it is the same thing all over again. It is a very unbelievable potential.

MR. KLASHMAN: I realize that you don't go and measure the acres when you go out and work them or farm them.

Thank you very much.

MR. CREMA: Thank you.

MR. STEIN: Do you have any questions, Dr. Kandle?

DR. KANDLE: No.

MR. STEIN: By the way, Mr. Crema, this is a very sophisticated statement. I don't know that you had to apologize, because I think, as far as I can see, you hit all the major points in controversy that we have to consider.

By the way, isn't Camden in South New Jersey?

MR. CREMA: Pardon?

MR. STEIN: Isn't Camden in South New Jersey?

MR. CREMA: Yes.

MR. STEIN: That's what I figured. You know, I used to work years ago back in the Public Health Service with the pig industry in Camden, and when you say what else is there in South New Jersey except the natural environment, come around sometime and I'll tell you. (Laughter)

DR. KANDLE: I don't think we ought to pin that one on Camden.

MR. STEIN: Yes.

DR. KANDLE: We would like to hear next from Mr. Bruce Larrabee.

Mr. Larrabee, I confess I don't have your accurate identification. Perhaps you will provide it.

STATEMENT OF BRUCE M. LARRABEE, PROFESSIONAL
ENGINEER, CHAIRMAN OF THE BARNEGAT BAY WATER-
WAYS IMPROVEMENT ASSOCIATION

MR. LARRABEE: Mr. Chairman and Members of the Panel:

I am Bruce M. Larrabee, a professional engineer, and I am Chairman of the Barnegat Bay Waterways Improvement Association, Inc. Unusually rapid population growth in Ocean County, where Barnegat Bay is located, has come from two sources. First, the construction of the Garden State Parkway has made this a commuter community to big industry in the north. Second, the summer vacation business has mushroomed where visitors can sail, swim and fish. Following are the increase rates from the 1960 Census:

	<u>Rate percent 7 years</u>
Brick township	69% to 27,404
Dover township	71% 29,621
Berkley township	60% 6,807

Each of these townships has several miles of waterfront on Barnegat Bay. Many of these shore developments lack any sewerage treatment facilities. Many houses are equipped with individual sewerage systems which pass the effluent through a septic tank and then into the porous soil by seepage pit or tile field. When these houses are along the bay shore the sewage effluent will often find its way to the bay.

A new factor will soon come into existence when the new nuclear power plant starts operation at Oyster Creek, a part of Barnegat Bay. It is estimated that the cooling water which passes through the plant will be raised 20 degrees to 104° Fahrenheit, when it leaves the plant. If this effluent goes round and round through the bay and back into the feed channel, things could get pretty hot. Experience on what this will do to fish and wildlife is unknown. The estimated discharge is 1,000 cubic feet per second, which creates a need for dilution.

Let me explain some basic physical facts about

Barnegat Bay so that you may have a better understanding of the problem. The total area of the Bay estuary is 73 square miles. Expressed in square feet, this is over two billion square feet (2,000,000,000). It is 25 miles long with the inlet near the south end. There are three connections with the sea, but the two besides Barnegat Inlet are of little consequence. The Bay Head Manasquan canal is only 100 feet wide. The Manahawkin Bay at the south end is 18 miles from Little Egg Inlet and has practically no effect. However, the opening of the inlet at Barnegat has been closing up for the last hundred years. Exhibit A, attached to this report, shows how the section of this channel has changed from being 4,700 feet wide in 1866 to its present width of 600 feet. The present inlet is in a remote position when related to the generally polluted areas. It is twenty-one miles from Toms River to the far end of the jetties. The nuclear power plant is nine miles away. An inlet much nearer the sources of pollution is one solution which deserves full consideration.

The range of tide in the bay is small, less than a half a foot. The ocean range is 4.3 feet from mean low water to mean high water. The narrow channel through the inlet is a restriction to the circulation and the dilution of the water. The Bay Head Manasquan canal is only 100 feet wide. The connecting bay on the south has a minimum effect

on tides. Polluted water in Barnegat Bay can only be reduced by improved flushing action and circulation through improved inlet conditions. Such a small part of the total volume of water in the bay passes out with the tidal current that pollution has reached a very serious impairment to the shellfish industry. Note Exhibit B, the charts of the Barnegat Bay area, which shows by dark shaded areas where the harvesting of shellfish has been condemned by the State.

History tell us that some twenty inlets that existed on the north Jersey coast north of Barnegat Inlet have been closed by nature. Barnegat Inlet will be the next unless government takes action without further delay. I thank you for the privilege of representing the Barnegat Bay Waterways Improvement Association.

I wish to further report to your honorable committee that I was privileged, through the courtesy of the United States Coast Guard, at the Barnegat Bay Light Station, to examine their daily records for the period from January 1, 1966, to September 30, 1967, covering twenty-one months. There were 92 groundings on sand in the Barnegat Inlet; there were 6 groundings on the rock jetties; there were 17 capsizings of boats and 14 sinkings, all of which required the assistance of the Coast Guard, which indicates that independent of the pollution problem, there is another

problem of the safety of the inlet. This is not meant to be a criticism of the United States Coast Guard activities, for they are to be commended for the lives they have saved in dealing with an unsafe inlet.

Thank you.

(Exhibits A, B and C, attached to Mr. Larrabee's statement, may be found in the files of the Department.)

MR. STEIN: Thank you, Mr. Larrabee.

Are there any comments or questions?

MR. KLASHMAN: No.

MR. STEIN: I asked a question earlier this morning about these inlets. I guess I anticipated this. I should have known this was coming up somewhere along the line.

MR. LARRABEE: I was waiting to answer.

MR. STEIN: Thank you.

DR. KANDLE: Mr. Chairman, I don't know that it is particularly germane here, but since the question of the temperature change in the bay has come up, I think it would be useful for me at least to report that the best information that we have is that the temperature change is going to make that portion of the Barnegat Bay about the same general temperature as lower Georgia and upper Florida, so I think we do know something about what is likely to happen. Nobody will know this until we try, but really it is a matter that

has had a great deal of attention.

MR. KLASHMAN: Dr. Kandle, it is my understanding from your policy statement that you have committed yourself, as I understand it, in the event that there were a problem created by temperature that affected a water use, that you would require whoever was causing it to do something about it. Isn't that correct?

DR. KANDLE: All the background work is already done, and we will be working on this and keep checking on it.

MR. KLASHMAN: Thank you.

DR. KANDLE: Mr. Larrabee has talked about Brick township, so perhaps it would be useful if we can hear now from Mr. D'Elia.

STATEMENT OF ANTHONY N. D'ELIA, PRESIDENT
OF THE COUNCIL, TOWNSHIP OF BRICK, BRICK
TOWN, NEW JERSEY

MR. D'ELIA: Thank you, Dr. Kandle.

Mr. Chairman, Members of the Committee:

For the record, my name is Anthony D'Elia. I am the President of the Council of the Township of Brick.

Brick township has been fighting pollution problems in the Metedeconk River and the upper reaches of Barnegat

Bay. We have on our own hired counsel to represent Brick township and have turned over to the counsel all the reports and studies that have been made over a period of years to be of assistance to you gentlemen in the study.

Our problem is that our community is essentially a sea shore community, and our principal industries are boating, fishing and summer residents. Our municipal engineers, our board of health and the Board of Health of the State of New Jersey have advised us that the bacteria count in the upper reaches of the Metedeconk River and Manasquan River have reached the danger point, dangerous enough that we believe that every effort has to be spent from any source to stop it and stop the continuation of this pollution.

The superabundance of noxious weeds that have plagued us for the past four years in the upper reaches of the Metedeconk River and Manasquan River substantiates a claim from the exhibit that I have examined of your condemned area charts, and the exhibits we have submitted which were prepared by the New Jersey State Department of Health Shellfish Program show that Brick Town is polluting approximately 4,400 acres of Barnegat Bay. We are not proud of this. However, if we examine Table 3 of this report that I only had the privilege of reading today, we will find that there are eleven systems that dump their effluent into the north

and southerly branches of the Metedeconk River.

We have done nothing more than reduce one of the most beautiful rivers in the State of New Jersey into a trunkline to carry pollution into the Barnegat Bay.

I have read Mr. Larrabee's report, who, by local reputation, is a very competent civil engineer, and the engineering reports that the Township of Brick has received, all of which have indicated that an interchange in waters of Barnegat Bay would materially decrease our problem for the time being.

An examination of the geographic flow of waters establishes that the upper Manasquan River empties into the Atlantic Ocean. However, prior to that time, by means of the Manasquan Inlet, it flows into the Point Pleasant Canal to Barnegat Bay, within a mile of which point the Metedeconk River also flows into the northern end of Barnegat Bay. This is substantiated by Exhibit B in our report.

We have also been advised by many agencies, State and Federal, of the possibility that the dredging of the Metedeconk River and the Manasquan River would eliminate the polluted beds and give us the opportunity for what we say is a fresh start, but I would like to say is a fresh water start.

The problem for a township of the size of Brick township is very severe, for we are in a labor-depressed area, and the potential loss of our principal industries, which are our waterways, will seriously affect our economy in the future. As one small municipality with limited finances, we cannot hope to cope with a regional problem.

We have gone as far as completing a feasibility study for a sewerage system for our township, the cost of which would be around \$20 million. This would have a discharge into the ocean, as was previously mentioned by other experts.

However, would this solve our problem? We in Brick township do not feel that this would solve the problem as the other townships are emptying their effluent into our river.

We firmly believe, as many of us do, that regionalization is the key to the situation. It is a fair statement to say at this time that it is the consensus of opinion of my fellow councilmen, Mr. Frank Neri, Mr. Quadara, Mr. Gaskill, Mr. McGee, Mr. Spivak and Mr. Jones, that the problem has to be solved on a regional basis, which has to include, among other things, dredging of the Manasquan River, the Metedeconk River and Barnegat Bay; and if the engineering studies will justify it, then we say the

installation of additional inlets into Barnegat Bay and definitely the re-installation of Barnegat Inlet.

The records of the Township of Brick are open for the inspection by any agency which is so inclined to make such inspection. We offer our utmost cooperation.

Thank you for this opportunity.

MR. STEIN: Thank you, Mr. D'Elia.

Are there any comments or questions?

MR. KLASHMAN: No.

MR. STEIN: This was a very excellent statement.

I would like to say one thing to you: I think we all may agree with you on your theory, but as far as our agency is concerned, the policy is pretty well set. It recommends dredging, but the prerequisite, though, is to control the pollution at the source.

I don't think that you are being very realistic if you are going to expect Uncle Sam to come ahead and dredge the waterways and give you inlets where you want them, where you still continue to pollute. In other words, you are going to have to put in the treatment plant or agree to put in the treatment plant before we will consider recommending dredging. This is a two-way street.

I hope that was the import of your remarks. The dredging is no solution, nor is the channel a solution if you

and the other townships are going to continue dumping your wastes into the water, because it is going to fill up again. We have to do both together.

I think the Congress has considered this very, very carefully. We will be glad to consider those projects and recommend them, but, again, the essential prerequisite is that you and the other towns get together with some kind of system.

MR. D'ELIA: Mr. Stein, I am very much aware of this, and I want you to know that we -- and when I say "we" I am referring to our township -- are very, very much desirous of putting in a municipal sewerage system.

However, we have right next to us Jackson township, and we call it the "Jolly Green Growing Giant." It is close to 100 square miles, and it is only 15 percent developed. Right now, we are suffering from the effluent of the minor development of this area, and the effluents of Lakewood township.

If we are going to spend \$20 million to clean up our own problems and still have to suffer with these townships at our left and our right dumping their effluent into our streams and river, we have a very serious problem.

On the other hand, being a small town, we cannot be expected to provide the future trunklines to cope with

the future growth of these other two townships on our own taxpayers. This has to be done under a regionalized system.

We have spoken to the other townships, and they feel that they are not ready yet to tie into a regional system, because their population explosion does not warrant it, so we are also faced with this problem.

We would like very much to clean up our own backyard, but we do not want people throwing their garbage into our yard either.

MR. STEIN: I couldn't agree with you more.

You have heard the New Jersey statement. They have issued orders. They have an assistance policy on this, and so do we.

I don't want to presume to speak for the State of New Jersey, but I think in this issue, in water pollution control, we see eye to eye.

I don't think we come into an area where we are going to ask one township or one instrumentality of government to do anything without asking all the others in the same drainage area to do something about the same time. We are going to do this on an equitable basis.

You have heard the New Jersey program, you have heard their time schedule, and I don't know that there is any escaping from that, and if it is adopted by the Federal

N. D'Elia

Government here, you are going to have to deal with those nice, amiable people from Trenton, deal with us so-called no-good witches from Washington, and you've got to have your choice.

MR. D'ELIA: We are in a position where we are willing to deal with anybody.

MR. STEIN: I really do think you recognize the problem.

MR. D'ELIA: Very much so.

MR. STEIN: The river has to be cleaned up.

Let me go over this again. We are ready to go to the Congress. The Corps of Engineers is a sister agency of ours and works very closely with us, but I think a prerequisite of getting the Corps to go in and dredge an inlet for water quality control is the fact that you have to do your job at the source of pollution. Water pollution control is not going to be provided by dredging an inlet. Water pollution control is going to be provided by providing treatment plants and collection systems.

MR. D'ELIA: We are all working for this.

MR. STEIN: That's right.

MR. D'ELIA: Thank you.

DR. KANDLE: Mr. Chairman, we would like now to hear from another shellfisherman, Mr. Stanley Cottrell. Here is another hard-working man who knows the industry and works

hard for the cause.

STATEMENT OF STANLEY COTTRELL, PARTNER OF
WILLIAM COTTRELL & SONS, PLANTERS, PACKERS
& PROCESSORS, CLAMS & CLAM PRODUCTS, WARETOWN,
NEW JERSEY

MR. COTTRELL: My name is Stanley Cottrell, and I am a partner of William Cottrell & Sons. We are members of the Oyster Institute of North America, and the South Jersey Shellfishermen's Association and Barnegat Bay Waterways Improvement Association, Inc.

The second week of May of this year, 1967, we closed our plant for the packing and processing of shellfish and shellfish products. With pollution increasing at an alarming rate, we felt that it was no longer feasible to continue to operate our plant, as we had in the past. We lease 27 acres of bottom from the State of New Jersey for the purpose of planting clams. At least three-quarters of this lease is now closed for the harvesting of clams due to pollution or the possible pollution of same.

When the nuclear electric plant at Oyster Creek goes into operation we are faced with the possibility of thermal pollution or thermal change, whichever you wish to

call it.

The year of 1966 we paid our shellfishermen \$400,000 for clams that they harvested in the Barnegat Bay area. This is dockside prices. This figure can actually be multiplied by 5, making it a two million dollar industry. I say this because you should take into consideration other business places that benefit by this industry, such as stores, gasoline stations, State and Federal taxes that are paid, utilities, etc.

There are many other problems in our industry, but pollution is No. 1. Without abatement of this problem I feel that the shellfish industry is going to continue to decline.

Thank you.

MR. STEIN: Thank you, Mr. Cottrell.

Are there any questions?

MR. KLASHMAN: No.

MR. STEIN: Dr. Kandle?

DR. KANDLE: No.

MR. STEIN: Thank you very much.

DR. KANDLE: Before you go, I remember some talk about the yield figure when we were working on the Raritan. Do you have any such numbers? Mr. Klashman asked about the yield.

S. Cottrell

MR. COTTRELL: Yield per bushel?

DR. KANDLE: He asked about bushels.

MR. COTTRELL: A yield from the clam itself after it has been processed and packed is anywhere from six to ten pounds per bushel of meat.

MR. KLASHMAN: What I was asking was, in your area how many bushels you would get per acre of shellfish?

MR. COTTRELL: That would be pretty hard to determine.

MR. KLASHMAN: Thank you.

MR. STEIN: Dr. Kandle?

DR. KANDLE: We have one more speaker, Mr. Chairman, Mr. William Meyer, who represents the New Jersey Sport Fishermen's Association.

MR. MEYER: Correction. It is the New Jersey State Federation of Sportsmen's Clubs.

MR. STEIN: You know, with all that. I think we are going to have to explore today, Mr. Klashman's question which is a pertinent one.

If we are making the statement that an acre of shellfish is producing more protein than an acre of farmland, we have to have some basis for that.

MR. KLASHMAN: Mr. Stein, we have figures that we have developed, and we have some sources. I was interested

Wm. Meyer

to see how the figures they are using compare with our own, but we do have figures, and Mr. Merrill will talk to us more later on that.

MR. STEIN: Thank you.

STATEMENT OF WILLIAM MEYER, REPRESENTING
THE NEW JERSEY STATE FEDERATION OF SPORTS-
MEN'S CLUBS

MR. MEYER: I am William Meyer, representing the New Jersey State Federation of Sportsmen's Clubs, with a total membership of over 33,000 sportsmen and conservationists.

The Water Pollution Control Committee has studied a document entitled "A Report to the N. J. State Department of Health on the Results of the Ocean Current Testing Program. Performed along the Southern Atlantic Coastal Region of N. J. during the Summer of 1966," prepared by Fellows, Reid and Weber, Consultant Engineers. This report recommends the length and location of outfall pipes for secondary treated sewage at Ocean City, Sea Isle City, Atlantic City, Avalon and Wildwood. The report indicates a 40' water depth is necessary to achieve a 100:1 dilution immediately over the diffuser section of the outfall. The committee submitted the following recommendations to the State Department of Health

on Sept. 25: Increasing (1) the Wildwood outfall from 2,700 yards to 3,000 yards; (2) Avalon from 1,800 yards to 3,300 yards; and (3) Ocean City from 3,000 to 4,000 yards.

The State Federation is opposed to the dumping of any and all primary treated wastes into the bays, rivers or ocean and urges that all such outfalls be discontinued as quickly as possible. We strongly urge that all wastes be secondary treated at the least or 95% BOD reduction be strictly enforced.

Our organization has been active in water pollution control for over fifteen years, largely as a reporting function through a pollution report form which the organization developed. We have been vexed for all these years by the fact that the New Jersey Division of Fish and Game cannot act on a water pollution case unless a fish kill is present. We have seen many cases reported to local health authorities and/or the State Department of Health for which no corrective action was apparently taken, at least to our knowledge. As time goes by, the pollution load which our streams and estuarine areas are forced to carry becomes steadily worse. We hope for improvement under the new Division of Clean Air and Water.

We are also very disappointed with the United States Senate approved appropriation of \$225 million for

Federal aid for sewage plant construction. New Jersey needs \$13 million for 1968; under the present appropriation the State will receive approximately \$5.6 million.

MR. STEIN: Thank you, Mr. Meyer.

Do we have any comments or questions?

MR. KLASHMAN: No questions.

MR. STEIN: Let me go off the record for a minute.

(Discussion off the record.)

MR. STEIN: May we go back on the record now?

Thank you very much.

DR. KANDLE: Mr. Chairman, just for the record and to make it complete, we have not spoken today of depuration, and I think that process has to be considered, and it may now be coming from areas which are less desirable. They can't come from the no-good areas, of course, but depuration is an important thing.

Just to keep the record straight, in New Jersey with the help of the New Jersey State Health Department, we have done work on this for about five years, and I think if we can get together now on the details with the Public Health Service so that we can have a system which is approved, this is something with which the industry can deal more positively.

That concludes the presentation of New Jersey,
Mr. Chairman.

J. De Groot

MR. STEIN: Thank you.

Let me go off the record once again.

(Discussion off the record.)

MR. STEIN: Mr. Klashman, do you have anything else?

MR. KLASHMAN: I have two other speakers.

MR. STEIN: Yes.

MR. KLASHMAN: We have two very brief statements, one by Mr. De Groot from Fort Monmouth, Camp Evans, and following Mr. De Groot, Mr. Merrill wants to make a brief second statement.

MR. STEIN: Mr. De Groot, do you have a copy of your statement?

MR. DE GROOT: No, I'm afraid not.

STATEMENT OF JOHN DE GROOT, SANITARY
ENGINEER, FORT MONMOUTH, NEW JERSEY

MR. DE GROOT: Mr. Chairman, Ladies and Gentlemen:

My name is John De Groot. I am the Sanitary Engineer for Fort Monmouth, and part of my function is also to be taking care of air and water pollution.

I am going to pass a few remarks about Camp Evans, which has been mentioned in this particular report

before this conference here, and give you an answer as to what the Army is, at least, thinking about.

Fort Monmouth cannot make a firm statement at this time how they will comply with water pollution control. However, they will comply with water pollution control, and I will indicate to you what we plan to do at Camp Evans.

The Evans plant is a small plant contributing in the order of about .02 to .025 million gallons per day. This is, of course, a very small amount, considering the overall pollution problem, but we have only offices, electronic research laboratories, utility shops, and plating shops, where some acids are generated which are passed through neutralizing tanks before they hit the sewage plant.

During Saturdays and Sundays, our flow is down to about 5 to 6,000 gallons per day, and that is, of course, a reason why we have such a high removal of BOD and suspended solids.

Because of the small flow, we are unable to operate the biofilters and, therefore, follow that up with secondary treatment or apply secondary treatment.

However, we wish to conform to these water pollution controls and the following steps are under consideration:

No. 1 would be to shut down our existing installation and install a package plant, which would be properly

sized for the load that we have at the moment being generated at this installation.

The second thought would be to join Wall township when it builds and operates its own plant, or uses improved facilities, that is to say, secondary treatment of Belmar in the Spring Lake Heights sewage treatment plant.

We are given to understand that if Wall township will build its own plant, it will probably start building in 1968, and hope to be in operation by 1970. Belmar and Spring Lake Heights have at the moment only primary treatment, but are evidently planning to complete their plants so as to provide secondary treatment by 1970.

Now, Fort Monmouth cannot make a commitment, obviously, until these various possibilities have been thoroughly investigated and after an economic study has been made, but we will cooperate in every possible way towards the elimination of water pollution.

I would like, if I may, to make just a few remarks. We highly endorse pollution control.

Of course, we are aware of the water problems, but as a taxpayer, as a shore resident, I think it would be important that we should not lose sight of the fact that as a requirement for longer ocean outfalls, as these become increasingly so, that becomes also a very expensive

proposition, which means that the taxpayers in all our towns have to pay more on an annual basis in order to get proper sewage disposal systems and services.

I would like to suggest very humbly that greater emphasis be put on giving our plants tertiary treatment and returning more of this water to the potable water strata.

In the area in Monmouth County, we are losing the water level at the rate of about 6 feet a year, and pretty soon, within a few years, it is not going to be a question of how much land do we have for people to live on, but it is going to be how much water do we have for people if they did come to live on the land that we do have, and so I think it becomes very important to give some very, very serious thought to the possibility of tertiary treatment and returning the water back to the potable water strata.

I think this would have two very desirable results. One of them would be to combat the threatened water shortage, and the second one would be to alleviate somewhat the tax burden which now rests pretty heavily on the taxpayers.

We must bear in mind that a good many of our citizens who are attracted to this area are senior citizens. They live pretty close to a very limited and fixed income, and they may very well suffer greatly if we keep on adding

taxes upon taxes to take care of this water pollution problem, if it can be done in some other way which would be cheaper, and, in addition to that, it would solve the pollution in our rivers and our basin and our oceans.

Thank you very much.

MR. STEIN: Are there any comments or questions?

(No response.)

MR. STEIN: If not, Mr. Klashman?

MR. KLASHMAN: I would like to ask Mr. Arthur Merrill to come up. I understand he wanted to make a supplemental statement.

Mr. Merrill.

FURTHER STATEMENT OF ARTHUR S. MERRILL

MR. MERRILL: This is not so much of a statement, but to bring up a couple of more points that have been thought of during the course of these discussions.

I won't make this in any formal language.

One thing is that the ocean discharge of disinfected highly treated effluent should have no bad effect on ocean animals, and the nutrients might even enhance their growth.

This has not been brought up as a possible good

effect that some of these waste products might have if they are properly treated in advance, and it should be made part of the record.

We have 33,000 closed acres at the present time, of which Dr. Kandle has estimated 58 percent can be brought back to usable form again if we start treating things right, but what got me in this report was the figure of two and a half bushels per acre that could be arrived at.

Doing a little figuring, just figuring this logically, if we use a figure of 440 clams equal two and a half bushels -- and I think we are being liberal -- of course, there are three different grade sizes of clams -- it would be something under 200 bushels. By using that figure, if you divide that into 440,000 square feet, you come up with one clam in every 100 square feet.

Now, I remember going clamming when I was a kid in some recreational areas, and I am sure I would have discovered quickly if I got one clam in a hayfield, so, without going further, this seems to be quite a low figure, and I am sure Mr. Cottrell would back me up on it.

I have read books on oyster production. I figure as many as 2,000 bushels can be grown on an acre.

We are working on advanced farming culture in our laboratory, and although we are dealing with off-bottom

cultures, we are getting 2,000 bushels in less than a half acre right now, and they are growing equal in growth on the bottom.

DR. KANDLE: Hard clams?

MR. MERRILL: I am talking about oysters. I haven't gotten these figures for hard clams, but I am sure these figures can be come up with very easily. On this 1 per square foot, it would come up with 10 times the figure. About 25 bushels per acre wouldn't seem to me to be anywhere out of order, and would be in a very low minimal state again.

MR. KLASHMAN: Thank you very much, Mr. Merrill.

We have no other Federal representatives, Mr.

Stein.

MR. STEIN: Dr. Kandle?

DR. KANDLE: No, sir.

MR. STEIN: Is there anyone else who wants to make a statement?

(No response.)

MR. STEIN: If not, the conferees will recess for an executive session. It is a quarter after four now. I think we probably will have an announcement at about five, or a quarter after five. If we are not prepared to make an announcement then, we will tell you.

We will stand recessed until shortly after five,

Closing Statements

and if you want to hear the announcement, you can come back and I think we will be ready then.

(Whereupon a recess was taken and the conferees went into executive session, following which they reconvened at 5:50 p.m.)

MR. STEIN: May we reconvene?

Dr. Kandle was with us during the executive session deliberations, but he had to leave for another engagement, and Mr. Sullivan, who is in charge of the Air and Water Pollution Control Program for the State of New Jersey, is with us.

I am sorry to have kept you waiting so long, but these things always take a little longer than we expected. As a matter of fact, I think we are just about twenty minutes past half past five, when I thought we would make it.

I am happy to announce that the conferees representing the State of New Jersey and the Federal Government have come to unanimous conclusions and recommendations.

I am really happy to announce this, because in a complicated problem like this, unless we really have unanimity of Federal, State and local people, I don't know whether we can come to any conclusions.

The recommendations and conclusions probably will

not come as a surprise to you if you have been here all day, as most of you have, but I suggest you may well listen very carefully to some of the wording on this, because there were significant areas of agreement reached in the executive session.

1. The estuaries and tributaries of Eastern New Jersey, from Shark River on the north to Cape May on the south, receive the discharge of wastes from municipal waste treatment plants, individual septic tanks and cesspools, boats and land drainage. As a result, these waters are polluted by bacteria, suspended solids and nutrients.

2. Because of the existing or potential pollution of these waters, the State of New Jersey, under the cooperative arrangements governing the National Shellfish Sanitation Program, has closed more than 36,000 acres of water to the direct harvesting of shellfish, leaving 127,000 acres available for shellfish harvesting. These closures have caused substantial economic injury resulting from the inability to market shellfish or shellfish products in interstate commerce. The estimated economic loss to the region is at least \$1.5 million annually.

3. The pollution of these navigable waters is subject to abatement under the provisions of Section 10 of the Federal Water Pollution Control Act, as amended.

4. In some areas, the pollution of these waters by suspended solids and nutrients has resulted in an unsightly appearance, the production of objectionable odors, and excessive growths of algae and other aquatic plants. These conditions limit the use of these waters for recreational bathing, boating and esthetic enjoyment.

5. Municipal and institutional waste discharges constitute the major sources of pollution of waters covered by the conference. All significant sources of such waste provide some form of treatment. Many of the existing treatment facilities do not provide sufficient removal or control of pollutants. The 98 municipal and institutional discharges impose a loading of 125,000 pounds per day of BOD (Biochemical Oxygen Demand) on the waters of the area.

6. Discharges from boats are an increasingly important source of pollution. Other sources of pollution to these waters include overflow of seepage from cesspools and septic tanks, and surface or groundwater runoff of agricultural chemicals.

7. Industrial waste discharges do not represent a significant source of pollution.

8. Pollution of these waters is complicated further by natural hydrographic conditions. Many of the bays have very restricted connections with the ocean. As a

result of this lack of available circulation, pollutants are not readily flushed from these waters, which further increases the degradation of water quality.

9. The New Jersey State Department of Health has adopted water quality standards for the waters covered by this report, and has submitted the standards to the Secretary of the Interior for approval as Federal water quality standards under the provisions of Section 10 of the Federal Water Pollution Control Act, as amended. These standards require that all wastes discharged to the Atlantic Ocean receive, as a minimum, treatment that will provide at all times 85 percent removal of BOD, and that all wastes discharged to the estuaries or tributary streams receive a minimum treatment at all times of 95 percent removal of BOD. Abatement orders issued under these standards further require effective year-round disinfection, with construction to be undertaken in accordance with the following schedule:

- a. Preliminary plans for treatment or for upgrading of facilities to be submitted on or before October 30, 1968;
- b. Final construction plans to be submitted on or before and approved by June 1, 1969;
- c. Construction to be initiated on or before October 1, 1969, and to be completed on or

before November 30, 1970.

New Jersey now has statutory authority to require water pollution control facilities to conform to State approved regional plans.

The treatment requirements and time schedule established by these standards and orders represents marked progress in pollution abatement.

10. However, to permit reopening of a maximum number of those areas presently closed to the harvesting of shellfish under the National Shellfish Sanitation Program, it will be necessary for even treated wastes to be eliminated, since some danger of contamination exists even when adequate treatment is provided. Construction of regional waste treatment systems which provide adequate treatment prior to discharge through a limited number of outfalls into the estuaries or through outfall lines extended into the Atlantic Ocean will permit opening many areas now closed to the harvesting of shellfish.

11. Control measures aimed at abating pollution from boats operating in the tidal waters of the area are to be adopted by the State of New Jersey. Such control measures require either adequate treatment facilities aboard vessels equipped with toilets, or holding tanks capable of holding waste material for subsequent discharge to on-shore treatment

facilities. Such regulations be adopted so that pollution from this source will be controlled no later than November 30, 1970.

12. To ensure that water pollution control plants operate at maximum efficiency, it is essential that proper operation and maintenance be provided. To this end full-time licensed operators be in charge of each treatment plant as required by the State of New Jersey, and adequate facilities and procedures be established to provide proper laboratory control for each plant.

That concludes the conclusions and recommendations of the conferees.

Do the conferees want to comment?

MR. KLASHMAN: I have no comment, Mr. Stein.

MR. SULLIVAN: No.

MR. STEIN: I also talked to Dr. Kandle and I have one suggestion which I discussed with him, which I would like to make part of the record.

In order for this regional approach to work and for these limited outfalls to provide a maximum number of areas to be available for water pollution control to work, we will require the maximum cooperation of all the interests in the area, and this means particularly the conservationists, the people interested in our water resources, whether they

are the estuaries or the ocean.

I hope as far as whatever arrangements we work out on a State or Federal level, that we will all sit down and work with New Jersey in working out these plans, so, when the regional plans which will provide the best hope for the solution of the area come forward, all of our ideas will be in there, and all the defects and the bugs as far as possible will be ironed out.

This means your cooperation, as well as ours. We have pledged to New Jersey to make the full resources of the Department of the Interior available in technical consultation with the New Jersey group. I hope that the local shellfish, conservation and municipal groups will provide the same kind of cooperation, because in a project of this kind -- and I think we are blazing the trail here in trying to get the maximum use of the water, particularly for shellfish harvesting, and in a densely populated area like this with a tremendous recreation industry -- and this is something that has not been done before -- New Jersey and the State authorities that have the primary rights and responsibilities are going to need all the help they can get, and I mean help. This is help from the beginning, and not sitting back on the sidelines and coming up with carbon criticism, however well-directed and however well-meaning after the plans are in

operation, or are reasonably well developed, because that is just going to delay things.

We all have to get together, work with New Jersey, and try to help them get this program moving. If you don't, I think we will condemn the State's control on that. If you do, I think we have a chance.

Are there any further comments or questions?

(No response.)

MR. STEIN: If not, I would like to thank all of you for staying with us through this.

I think this has been a very significant and productive conference. We do have a cooperative Federal-State-local program which is going to be a trail-blazer in water resource development. I can only hope it is going to work.

Thank you very much.

We stand adjourned.

(Whereupon, at 6:02 p.m., the conference was adjourned.)

(The following was submitted for inclusion in the record:)

(SEAL) SMALL BUSINESS ADMINISTRATION
 10 COMMERCE COURT
 NEWARK, NEW JERSEY 07102
 NOVEMBER 7, 1967

Federal Water Pollution Control Administration
Metuchen, New Jersey 08840

Attention: Paul Resnick

Gentlemen:

The Small Business Administration has established a priority category to assist small businesses engaged in projects designed to abate air and/or water pollution.

Businesses engaged in the manufacture of machinery, equipment and devices designed to reduce air or water pollution are given priority consideration on loan requests to further the production, sales, or distribution of such products. Special consideration is also given under this category to small businesses who intend to use the proceeds of a loan to purchase, install, or erect a device which will reduce air or water pollution.

Businesses interested in applying for loans in this

category must present to SBA the following information:

1. A letter from their local bank to indicate whether or not the bank is willing to grant the loan directly or in participation with SBA.
2. Financial Statements for each of the last three (3) fiscal years and for the current year to date.
3. A statement substantiating how the loan will contribute to the reduction of air and/or water pollution.

We hope the foregoing statement will serve to indicate this Agency's interest in reduction of air and water pollution.

Very truly yours,

Andrew P. Lynch

Regional Director

By: (s) Robert G. Snyder

Robert G. Snyder

Loan Officer

* * *